The PHOTOFACT Servicer

SET 419 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ NOV. 1, 1958

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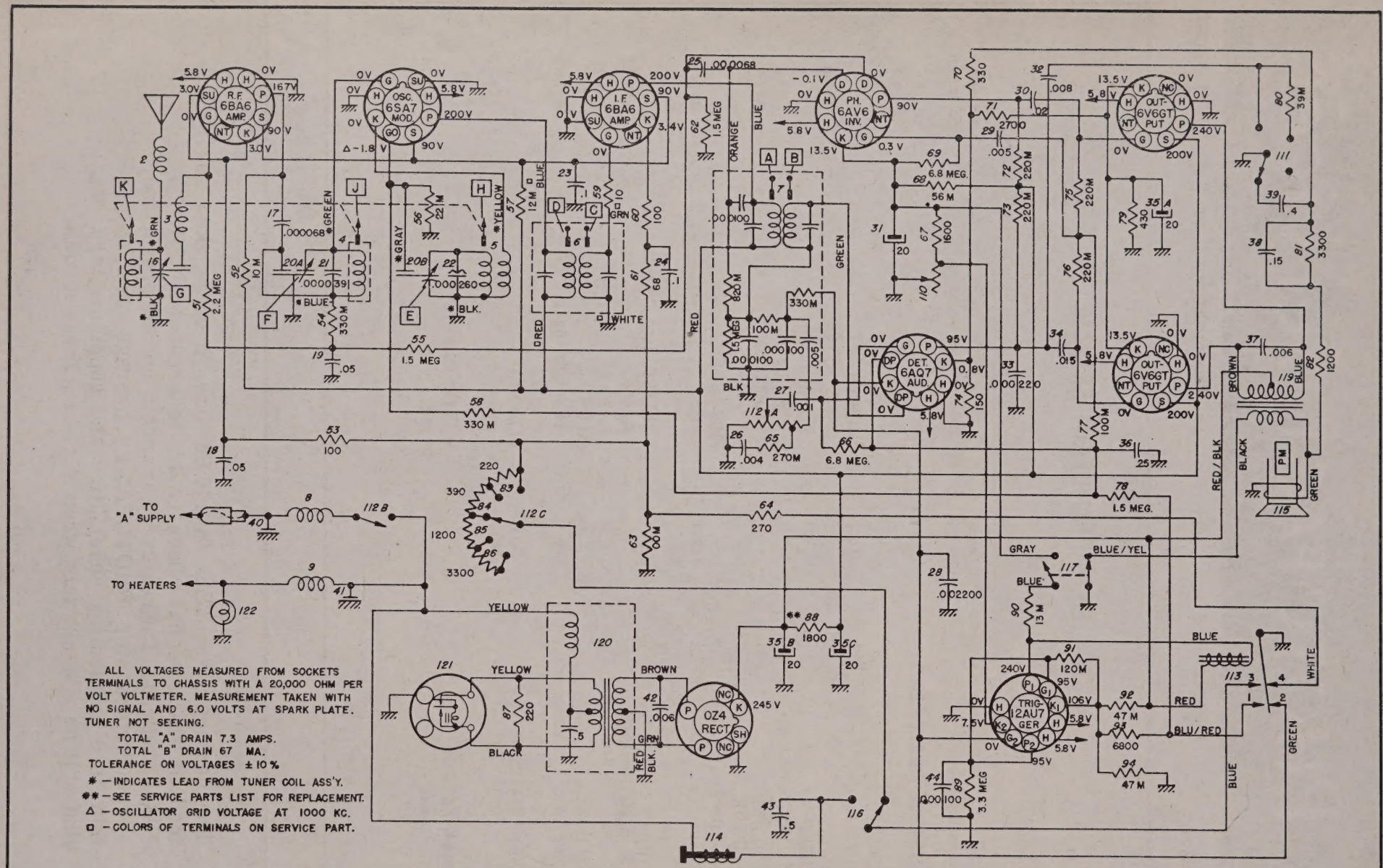
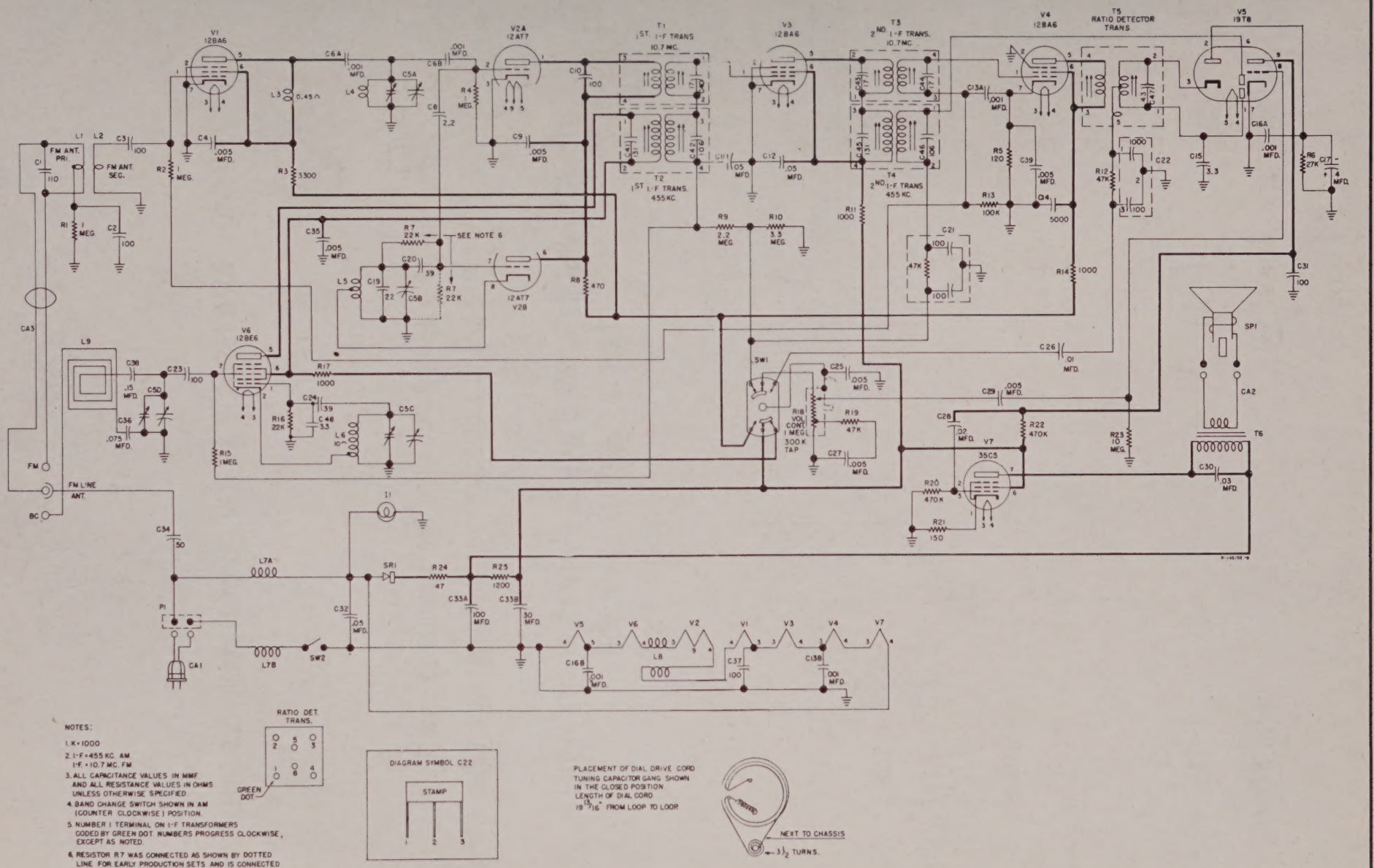
The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.


R.F. 6BA6 AMP.
OSC. 6SA7 MOD.
I.F. 6BA6 AMP.
PH. 6AV6 INV.
OUT- 6V6GT PUT
DET. 6AQ7 AUD.
TRIG. 12AU7 GER.
0Z4 RECT.
TO "A" SUPPLY
TO HEATERS
ALL VOLTAGES MEASURED FROM SOCKETS TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENT TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TUNER NOT SEEKING.
TOTAL "A" DRAIN 7.3 AMPS.
TOTAL "B" DRAIN 67 MA.
TOLERANCE ON VOLTAGES ± 10 %
* — INDICATES LEAD FROM TUNER COIL ASS'Y.
** — SEE SERVICE PARTS LIST FOR REPLACEMENT.
△ — OSCILLATOR GRID VOLTAGE AT 1000 KC.
□ — COLORS OF TERMINALS ON SERVICE PART.

CADILLAC MODEL 7258865, FOR ALL 1950 CADILLAC CARS

SCHEMATIC DIAGRAM COURTESY DELCO RADIO, DIV. OF GENERAL MOTORS CORP.

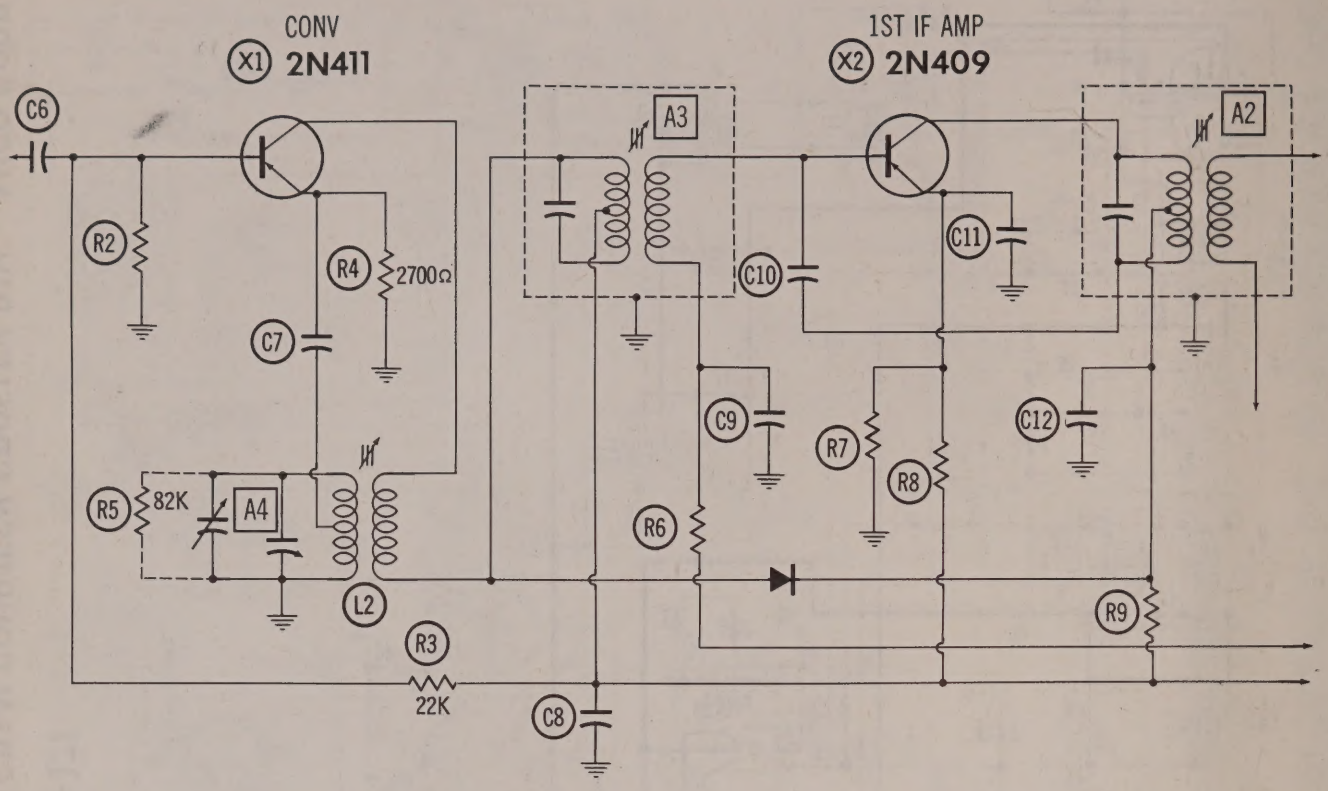


NOTES:

1. K = 1000
2. I-F = 455 KC. AM
   I-F = 10.7 MC. FM
3. ALL CAPACITANCE VALUES IN MMF AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
4. BAND CHANGE SWITCH SHOWN IN AM (COUNTER CLOCKWISE) POSITION.
5. NUMBER 1 TERMINAL ON I-F TRANSFORMERS CODED BY GREEN DOT. NUMBERS PROGRESS CLOCKWISE, EXCEPT AS NOTED.
6. RESISTOR R7 WAS CONNECTED AS SHOWN BY DOTTED LINE FOR EARLY PRODUCTION SETS AND IS CONNECTED AS SHOWN BY SOLID LINES FOR LATER PRODUCTION SETS.

CROSLEY MODEL 10-127

SCHEMATIC DIAGRAM COURTESY CROSLEY DIV., AVCO CORP.



RCA 1-BT-41, 1-BT-46, 1-BT-48

PHOTOFACT FOLDER 410-14

PRODUCTION CHANGE TO IMPROVE PERFORMANCE

R3 was changed from 27k ohms to 22k ohms.

R4 was changed from 1000 ohms to 2700 ohms.
R5 was removed.

THIS INFORMATION COURTESY RCA SERVICE COMPANY

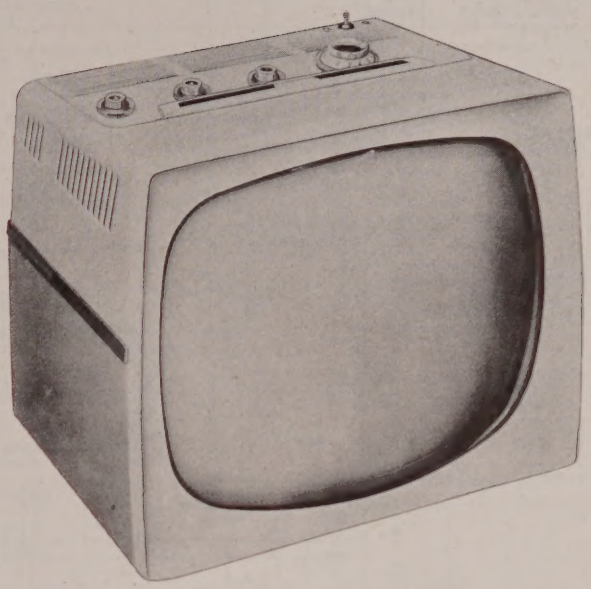
PHOTOFACT* Folder
*TRADE MARK
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

AIRLINE MODEL WG-4204A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type knobs from the top.
2. Remove 5 metal screws holding the rear cover. Remove the rear cover.
3. Remove 2 metal screws holding the front. Pull front out at bottom and lift up. Remove safety glass.
4. Remove 2 metal screws holding the antenna terminal board.
5. Remove the 2 trim strips from the sides.
6. Remove 8 metal screws holding the top of the cabinet. Remove the speaker leads and the top.
7. Remove 2 hex nuts and 1 bolt holding resistor terminal board.
8. Remove 2 metal screws holding the AC interlock.
9. Remove the picture tube socket, yoke plug and HV lead.
10. Remove 2 side chassis bolts and 2 bottom chassis bolts.
11. Remove the chassis.



CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Airline MODEL WG-4204A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 170 Watts, 1.65 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supply power to the receiver. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws from the bottom edge of the front. Pull front out at the bottom and lift up to remove.

SPECIAL ADJUSTMENTS

A. Focus
No provision is made to vary the focus on this receiver.

B. Range
Observe the picture and advance the Range Control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart.)

FUSE DEVICE

A Circuit Breaker is used for LV power supply protection, and may be reset by depressing the reset button. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H715R

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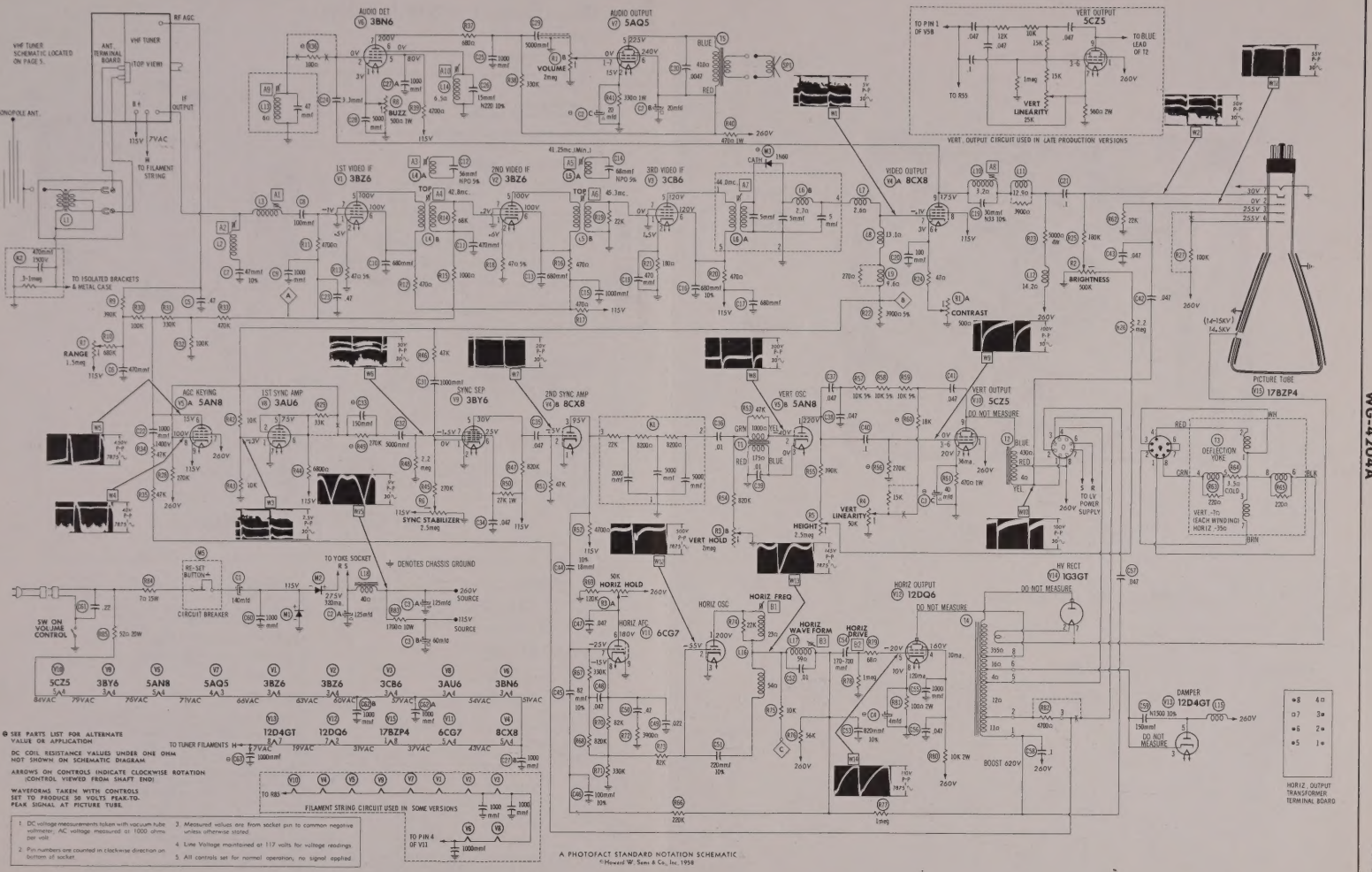
AIRLINE MODEL WG-4204A
AIRLINE MODEL WG-4204A
SET 419 FOLDER 1


AUDIO DET
6BN6
AUDIO OUTPUT
5AQ5
VOLUME
2meg
BUZZ
VERT OUTPUT
5CZ5
VERT LINEARITY
25K
VERT. OUTPUT CIRCUIT USED IN LATE PRODUCTION VERSIONS
1ST VIDEO IF
3BZ6
2ND VIDEO IF
3BZ6
3RD VIDEO IF
3CB6
VIDEO OUTPUT
8CX8
BRIGHTNESS
500K
CONTRAST
500Ω
PICTURE TUBE
17BZP4
DEFLECTION YOKE
RANGE
1.5meg
AGC KEYING
5AN8
1ST SYNC AMP
3AU6
SYNC SEP
3BY6
2ND SYNC AMP
8CX8
SYNC STABILIZER
2.5meg
VERT OSC
5AN8
VERT OUTPUT
5CZ5
DO NOT MEASURE
VERT HOLD
2meg
HEIGHT
2.3meg
VERT LINEARITY
50K
HV RECT
1G3GT
HORIZ HOLD
50K
HORIZ AFC
6CG7
HORIZ OSC
HORIZ FREQ
HORIZ WAVE FORM
HORIZ DRIVE
HORIZ OUTPUT
12DQ6
BOOST 620V
DAMPER
12D4GT
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD
RE-SET BUTTON
CIRCUIT BREAKER
SW ON VOLUME CONTROL
TO YOKE SOCKET
DENOTES CHASSIS GROUND
260V SOURCE
115V SOURCE
VHF TUNER SCHEMATIC LOCATED ON PAGE 5.
ANT. TERMINAL BOARD
VHF TUNER
TOP VIEW
RF AGC
IF OUTPUT
MONOPOLE ANT.
115V 7VAC
TO FILAMENT STRING
TO ISOLATED BRACKETS & METAL CASE
TO TUNER FILAMENTS
FILAMENT STRING CIRCUIT USED IN SOME VERSIONS
TO R85
TO PIN 4 OF V11
5CZ5 5AT4 84VAC
3BY6 3AT4 79VAC
5AN8 5AT4 70VAC
5AQ5 6AX3 71VAC
3BZ6 3AT4 66VAC
3BZ6 3AT4 63VAC
3CB6 3AT4 20VAC
3AU6 3AT4 25VAC
3BN6 3AT4 54VAC
51VAC
12D4GT 6AT4 19VAC
12DQ6 7AT4 31VAC
17BZP4 11AT8 37VAC
6CG7 3AT4 43VAC
8CX8 5AT4
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured voltages are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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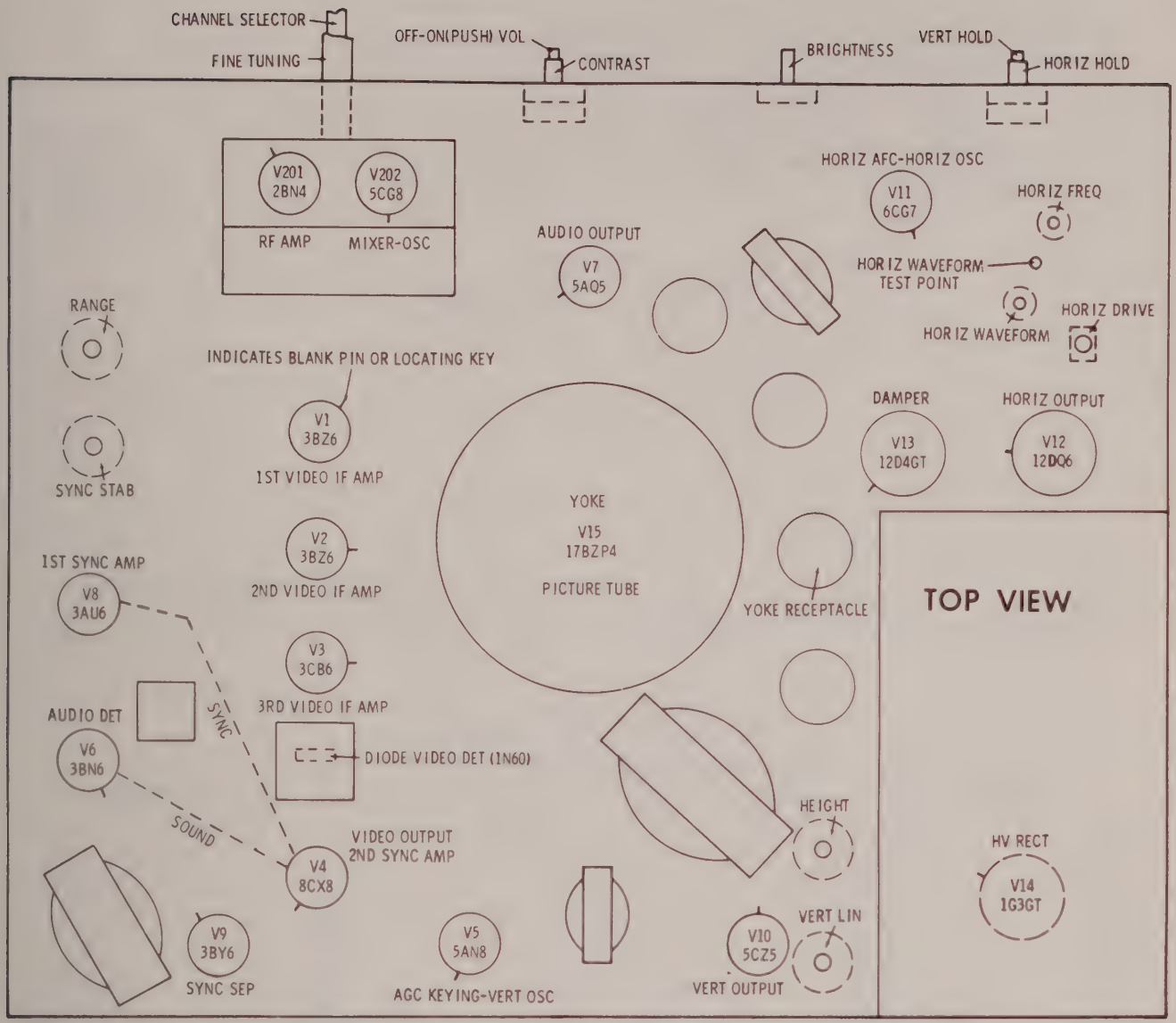
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

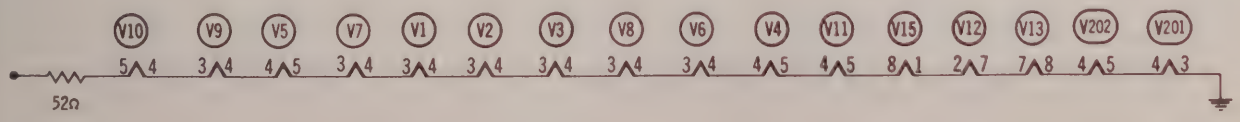
POWER SUPPLY FAILURE
No raster, no sound — Circuit Breaker (M5), Rectifiers (M1, M2)

SWEEP FAILURE
No raster, has sound — V11, V12, V13, V14, V15
No vertical deflection — V5, V10
Poor vert. linearity or foldover — V5, V10
Poor horiz. linearity or foldover — V11, V12, V13
Narrow picture — V11, V12, V13, M1, M2
Vert. off freq. — V5
Horiz. off freq. — V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster — V1, V2, V3, Diode (M3), V4
No pic, no sound, has snow — V201, V202, V1
No pic, has sound, has raster — V4, V15
Has pic, no sound — V6, V7
Overloaded picture — V5

SYNC FAILURE
No vert. sync — V8, V9, V4
No horiz. sync — V8, V9, V4, V11
No vert. or horiz. sync — V8, V9, V4

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



AIRLINE MODEL WG-4204A

FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	43.5MC (15MC Swp)	41.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru detector probe (Fig.1) to pin 5 (plate) of 1st. Video IF Amp. (V1). Low side to chassis.	A1, A2, A3, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A1 and Mixer Plate Coil control shape of curve top and position of 45.75MC marker. Adjust A2 to position 41.25MC marker and A3 to position 47.25MC marker.
2.	"	"	Not used	42.8MC (Unmod)	"	USE VTVM. DC probe to point (B). Common to chassis (Across Video Det. Load)	A4	Adjust for maximum gain.
3.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM deflection.
4.	"	"	"	45.3MC	"	"	A6	Adjust for maximum deflection.
5.	"	"	"	44.0MC	"	"	A7	"

4.5MC TRAP ALIGNMENT

Restore receiver to normal operation and tune in a TV station. Adjust Fine Tuning until a beat pattern is noted in the picture. Adjust A8 until the horizontal scanning lines are smooth and continuous.

SOUND IF ALIGNMENT

Tune in a TV signal and adjust controls for normal operation. Reduce the signal strength by connecting an adjustable attenuator in series with the antenna lead. Attenuate signal until a hiss is heard in the sound similar to super-regeneration. Adjust A9, A10 and the Buzz Control (R8) for maximum undistorted sound with MINIMUM buzz.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 12.

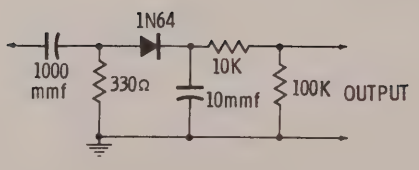


FIG.1

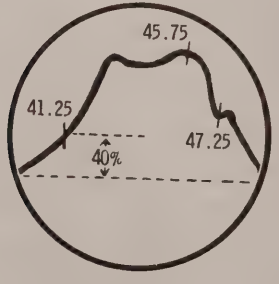
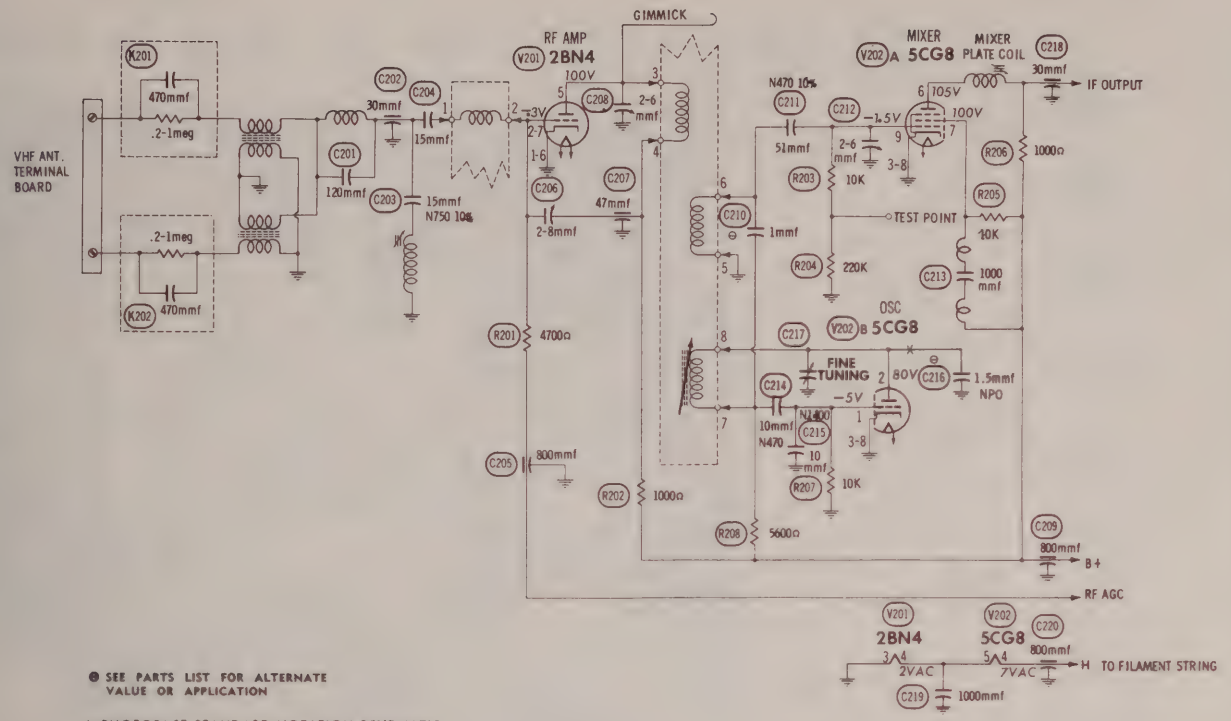


FIG. 2



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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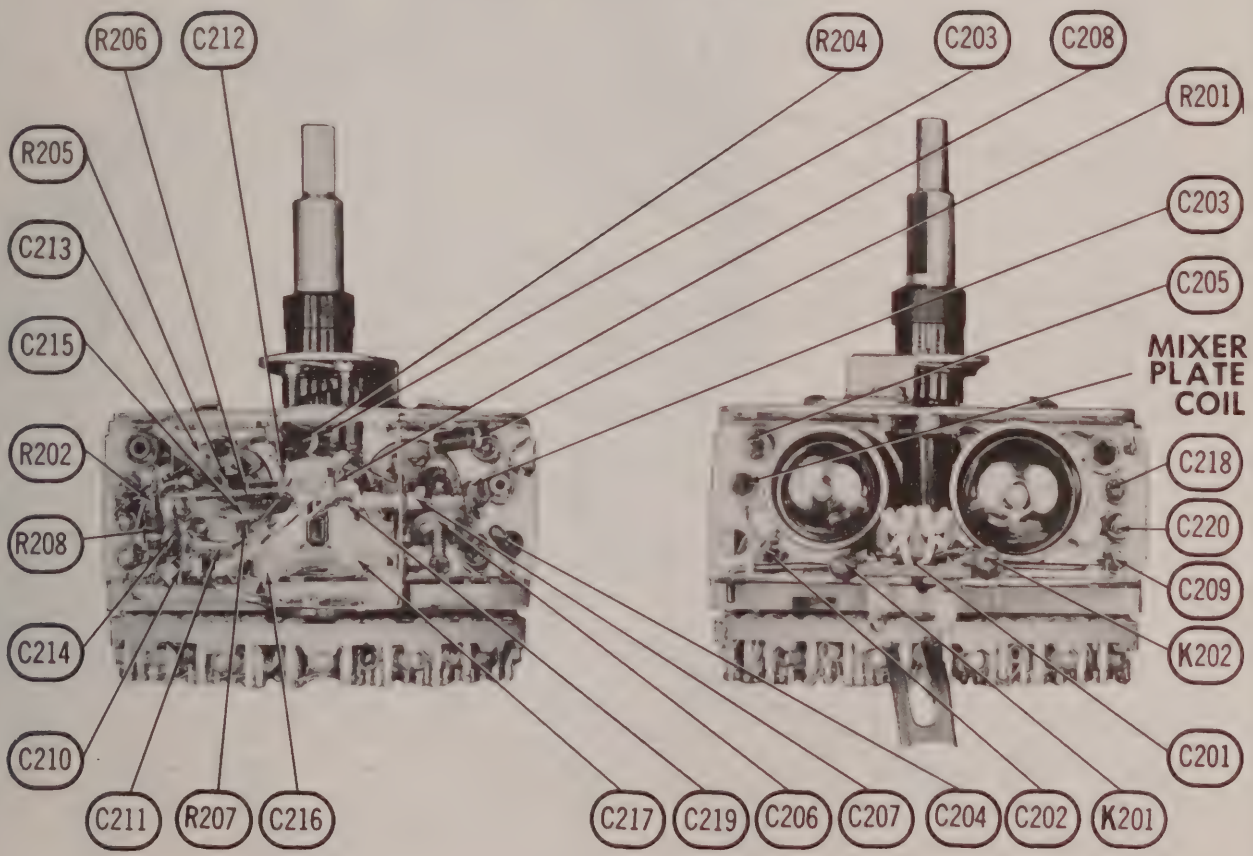
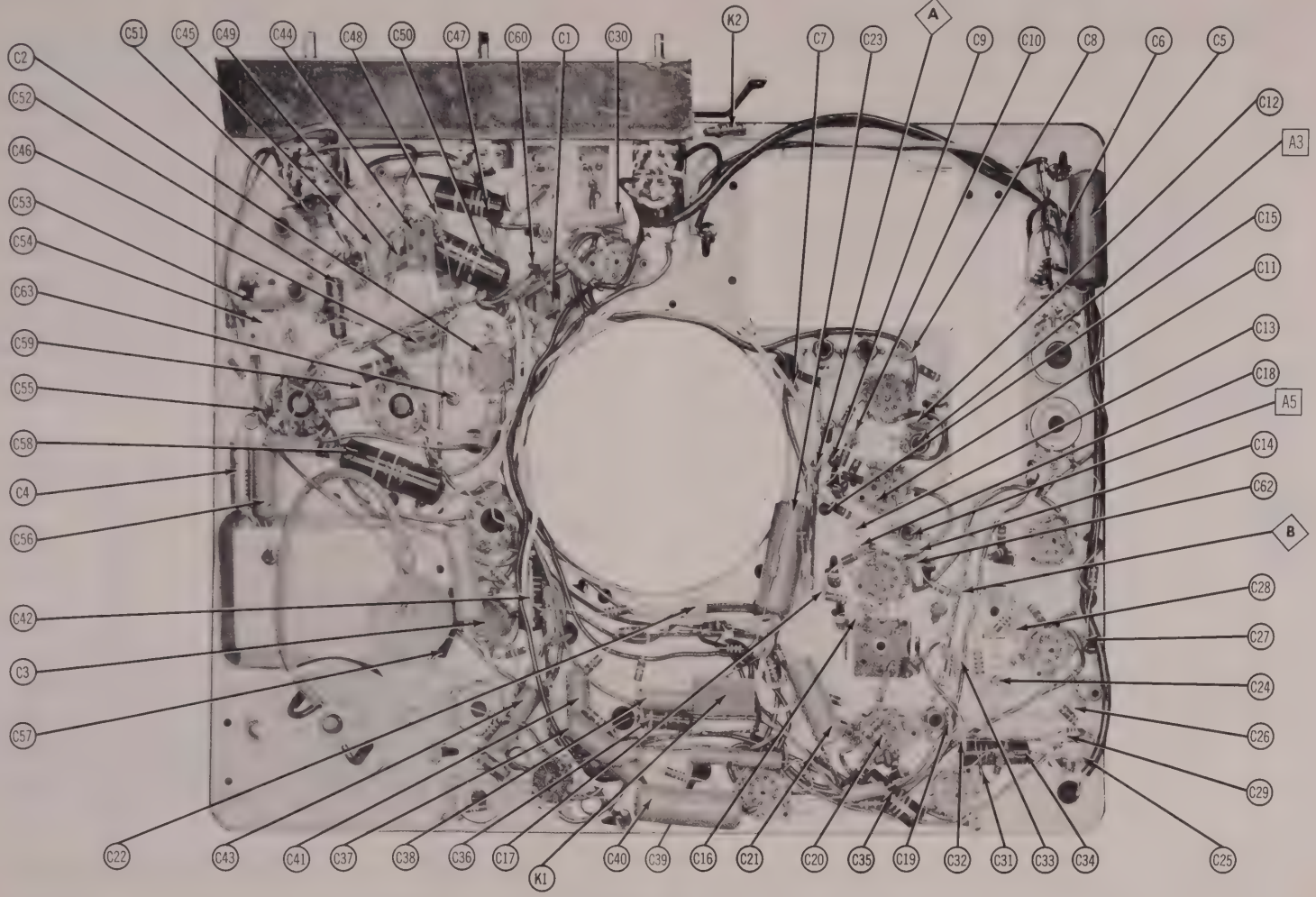
VHF TUNER #25A1169

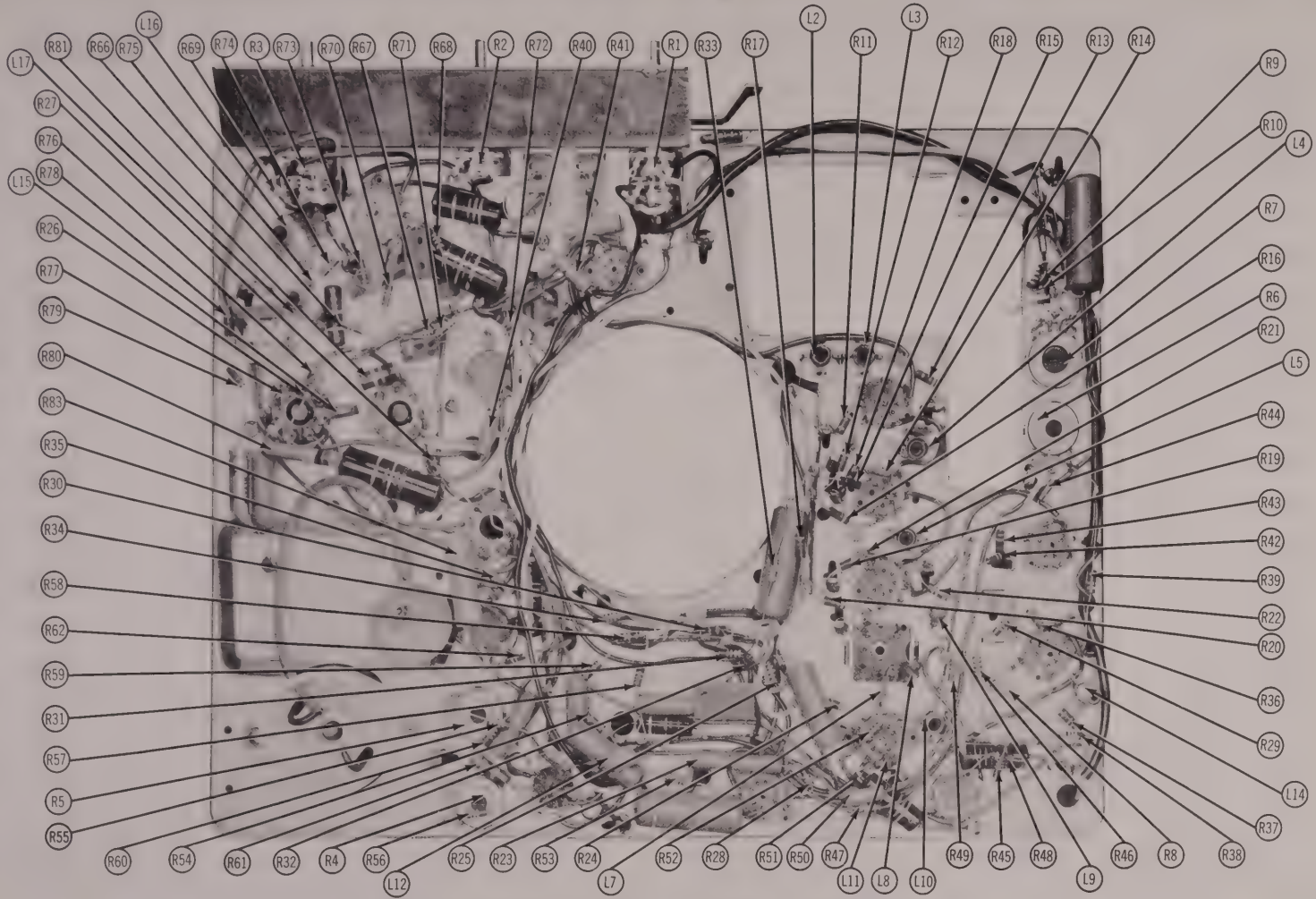


RF TUNER

SET 419 FOLDER 1



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	3BZ6	
V2	2nd Video IF Amp	3BZ6	
V3	3rd Video IF Amp	3CB6	
V4	Video Output-2nd Sync Amp	6CX8	
V5	Aux. Keying-Vert. Osc.	5AN8	
V6	Audio Det	3BN6	
V7	Audio Output	3AQ5	
V8	1st Sync Amp	3AU6	
V9	Sync Sep.	3BY6	
V10	Vert. Output	5C22	
V11	Horiz. AFC-Horiz. Osc.	6CG7	
V12	Horiz. Output	12DQ6	
V13	Damper	12DMG7	
V14	HV Rectifier	1G3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	AIRLINE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	17BZP4		17BZP4	17BZP4	① "Silvermate" ⑧ ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C3	140	150	48X48	AFHH-23	XA0361	FP1J7	TMS-24	T-055	TVL-1428
C3A	②20	300	48X40	AFH4-02-00	XC0733.2	FP2J8 *FT250X20		Q-222.2 *MT-0520	R2376 *
B	②20	350							
C	②30	50							
C3A	②20	300	48X40	AFH3-00-83	XC0733.7	FP330/27	TMT-28	T-115 MT-0550	TVL-2574 6
B	②60	350							
C	②40	50	1						
C4	4	50	2		PRS150V4	BBR4-50	TTS0X5	TD-4-50	MT-0504	TE-1202 1

① In some versions C3C and C3C may be interchanged, or C3C may be omitted.
② Some versions may use a 6mfd ③ 90VDC in this application (Part 9-45X48 1.
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	SPRAGUE PART No	NOTES
C5	47	200		P288N-47		CUB2P47	GEM-3047	STM-P47	
C6	470			BPD-00047	DD-471	UJ0747	UC-5347	5GA-T47	
C7	47			HPO-61 47	DS-470	UA0947		5TCC-Q47	10%
C8	100			SI 100	DS-101	UJ0T1	UC-S31	5GA-T1	
C9	1000			BPD-001	DD-102	BYA5D1	DCS2I	5HK-D1	
C10	680			BPD-00068	DD-681	UJ0768	UC-5368	5GA-T68	
C11	470			BPD-00047	DD-471	UJ0747	UC-5347	5GA-T47	
C12	56								NPO 5%
C13	680			BPD-00068	DD-681	UJ0768	UC-5368	5GA-T68	
C14	68				DTZ-68				NPO 5%
C15	1000			BPD-001	DD-102	BYA5D1	DCS2I	5HK-D1	
C16	680				MD-681				10%
C17	680			BPD-00068	DD-681	UJ0768	UC-5368	5GA-T68	
C18	470			BPD-00047	DD-471	UJ0747	UC-5347	5GA-T47	
C19	39		47X369						N33 10%
C20	100			SI 100	DS-101	UJ0T1	UC-S31	5GA-T1	
C21	1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C22	1000	1400		HVD15-1000	DD90-102	HVB0E1	DC90I	20GA-D1	
C23	.47	200		P288N-47	DF-503	CUB2P47	GEM-3047	STM-P47	
C24	3.3		47X588	NPO-61 3.3	TCZ-335	CTA6V33C	ZT-5333	5TCCB-V33	
C25	1000								10%
C26	15								N330 10%
C27A	1000		80X3	BPD-2X001	DD2-102	BYD6D1	DCD2I	5HK-2D1	
B	1000								
C28	5000			BPD-005	DD-502	BYA10D5	DCS2S	5HK-D5	
C29	5000			BPD-005	DD-502	BYA10D5	DCS2S	6HK-D5	
C30	.0047	600		P488N-0047	D6-472	CUB4D47	GEM-6247	6TM-D47	
C31	1000			BPD-001	DD-102	BYA6D1	DCS2I	5HK-D1	
C32	5000			BPD-005	DD-502	BYA10D5	DCS2S	5HK-D5	
C33	150			BPD-00015	DD-151	UJ0T15	UC-S315	5GA-T15	①
C34	.047	600		P488N-047	DF-503	CUB4S47	GEM-6147	6TM-S47	
C35	.047	600		P488N-047	DF-503	CUB4S47	GEM-6147	6TM-S47	
C36	51	600		P488N-0	D6-103	CUB4S1	GEM-611	6TM-S1	
C37	.047	600		P488N-047	DF-503	CUB4S47	GEM-6147	6TM-S47	
C38	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	4TM-S47	
C39	.01	600		P488N-0	D6-103	CUB4S1	GEM-611	6TM-S1	
C40	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C41	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C42	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C43	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C44	18			1469-000018	DD-180	22R5Q18		MS-418	10%
C45	82			1469-000082	DD-820	22R5Q82		MS-482	10%
C46	100			1469-0001	DD-101	22R5T1	MCB235	MS-31	10%
C47	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C48	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C49	.022	300		P388N-022	DD-303	CUB4S23	GEM-4123	2TM-S23	
C50	.47	200		P288N-47		CUB2P47	GEM-2047	2TM-P47	
C51	220			1469-00022	MD-221	22R5T22		MS-322	10%
C52	.01	600		P488N-01	D6-103	CUB4S1	GEM-611	6TM-S1	
C53	820		ACM30B82BK	1469-00043		18R7S8		MS-382	10%
C54	170- 700		17A272						
C55	1000			BPD-001	DD-102	BYA5D1	DCS2I	5HK-D1	
C56	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C57	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C58	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C59	150	5000	47X758						N1500 10%
C60	1000			BPD-001	DD-102	BYA6D1	DCS2I	5HK-D1	
C61A	.22	600		P488N-23		CUB4P22	GEM-4022	4TM-P22	
B	1000			BPD-2X001	DD2-102	BYD6D01	DCD52I	5HK-2D1	
C62	1000			BPD-001	DD-102	BYA6D1	DCS2I	5HK-D1	②

① Some versions may use 330mmf in this application as part of a component combination.
② Not used in some versions.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	78X94				UR1238	Contrast
B	2meg	½					Not Req.	Volume
C	Switch						Not Req.	Push-Push
R2A	500K	½	40X433	AB-59	A47-500K-Z	QH-133	U50	Brightness
B	Shaft	½		AK-19	BB-3/8	WQ ①	DS-37	
R3A	50K	½	78X35	F1-39			■UR2356	Horiz. Hold
B	2meg	½		R2-87				Vert. Hold
R4A	50K	1	40X436	AB-31	B47-50K-S	QH-123	PTA54L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R5A	2.5meg	1	40X398	AB-53	B47-2.5meg-S	QH-239	SU-565	Height
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R6A	2.5meg	1	40X398	AB-53	B47-2.5meg-S	QH-239	SU-565	Sync Stab
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R7A	1.5meg	1	40X437	AB-743	B47-1.5meg-S	QH-138	PTA1254L	Range
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R8	500Ω	1(WW)	40X397		39-500		FL-500	Buzz

■ "STA-LOC" Equivalent : FA541, OF1000, RU381, IS1625

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING OHMS	RATING WATT	AIRLINE PART No	NOTES
R9	390K			
R10	680K			
R11	4700Ω			
R12	470Ω			
R13	47Ω 5%			
R14	68K			
R15	1000Ω			
R16	470Ω			
R17	470Ω			
R18	47Ω 5%			
R19	22K			
R20	470Ω			
R21	180Ω			
R22	3900Ω 5%	4	43X338	
R23	5000Ω	4	43X338	
R24	47Ω			
R25	180K			
R26	2.5meg			
R27	100K			
R28	270K			
R29	33K			
R30	100K			
R31	330K		B84334	
R32	100K			
R33	470K			
R34	47K			
R35	47K			
R36	100Ω			Note 1
R37	680Ω			
R38	330K			
R39	4700Ω			
R40	470Ω	1		
R41	330Ω	1		
R42	10K			
R43	40K			
R44	6800Ω			
R45	270K			
R46	47K			
R47	620K			

ITEM No	RATING OHMS	RATING WATT	AIRLINE PART No	NOTES
R48	2.2meg			
R49	270K			Note 3
R50	27K	1		
R51	47K			
R52	4700Ω			
R53	47K			
R54	820K			
R55	390K			
R56	270K			Note 3
R57	10K 5%			
R58	10K 5%			
R59	10K 5%			
R60	18K			Note 4
R61	4700	1		
R62	22K			
R63	220Ω			
R64	3.5kCold			
R65	220Ω			
R66	240K			
R67	330K			
R68	820K			
R69	130K			
R70	82K			
R71	330K			
R72	3900Ω			
R73	82K			
R74	22K			
R75	10K			
R76	56K			
R77	1meg			
R78	1meg			
R79	68Ω			
R80	10K	2		
R81	100Ω	2		
R82	4700Ω			
R83	1700Ω	10	43X294	
R84	7Ω	15	43X303	
R85	82Ω	20	43X302	

Note 1. Not used in some versions
Note 2. Some versions may use 150K in this as part of a component combination
Note 3. Some versions may use 470K in this application.
Note 4. Some versions may use 15K in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No.	NOTES
L1	Ant. Trans.	9A2417					
L2	39MC Coil	9A2369		TV-153	4306		
L3	1st. Video IF	9A2365	17-4534	TV-131		VF-4	
L4A	47.25MC Trap	9A2363	17-4536		6232		
B	2nd. Video IF						
L5A	41.25MC Trap	9A2414	17-4535		6221		
B	3rd. Video IF						
L6A	4th Video IF	9A2370	17-4514 *				Includes M3, and Caps.
B	Resonant Choke						
L7	Resonant Choke	9A2375					
L8	Shunt Peaking Coil	36A13	19-2160	TV-196	6130	VP-5	160 Microhenries
L9	Shunt Peaking Coil	36A36	19-2100	TV-194	6112	VP-3	100 Microhenries
L10	4.5MC Trap	9A2366	20-1004	TV-151	1459 †	SF-3	
L11	Series Peaking Coil	36A43	19-2161	TV-196	6120	VP-5	150 Microhenries
L12	Shunt Peaking Coil	36A2	19-4201	TV-184	6180	VP-5	190 Microhenries
L13	Sound IF	9A2434		TV-154			
L14	Quadrature Coil	9A2367	20-1005	TV-121	1480		
L15	RF Choke	9A2380		SW-531	4609		5 Microhenries

* Enlarge mounting holes. † Disregard tap.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	Meissner PART No.	Merit PART No	Miller PART No.	Rom PART No.	Thordarson PART No.	NOTES
L16	77Ω *		9A2416		TV-165	6212		HS-7	Horiz. Freq * Tapped @ 54Ω Horiz. Waveform
L17	59Ω		9A2372						

FILTER CHOKE

ITEM No	RATINGS CURRENT (Measured)	RATINGS DC RES	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L18	.330A	40Ω	1 Hy.	52X96-7					26C44 ①	

① Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA AIRLINE PART No	Halldorson PART No	Merit PART No	Rom PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T1	Vert. Osc.	54X19	B6703	A-3003	V40S	A-8135	26A03	A-57X	
T2	Vert. Output	51X21					26B54	A-113X ②	
T3 A	Yoke-Horiz. (99MH)	9A3415			Y-110 ①②	DY-37A①	Y-52 ①	Y-60 &	
B	(105°)-Vert. (33MH)							NW23	
	Rear Cover & Centering Device	2A486							
	Yoke Clamp	30X622							
T4	Horiz. Output	53X366							

① Use original rear cover and centering device, horizontal damping network.
② Connect yoke terminal #2 to yoke plug pin #4, yoke terminal #1 and #3 to yoke plug pin #3, yoke terminal #5 to yoke plug pin #2.
③ Connect as autoformer

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6100Ω	3-4Ω	51X185	Z1110	A-3026	AU-602 ①	A-3877 ①	24B51 ①	S-6X	① Drill new mounting hole.

SPEAKER

ITEM No	TYPE SIZE	TYPE FIELD	TYPE V C	TYPE IMP	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω		12A541	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K1	Vert. Integrator	2000mmf, 5000mmf, 6000mmf, 8200Ω, 8200Ω, 22k	78X7	Aerovox PA-110 Centralab PC-104 Cornell-Dubilier 1127M2 Sprague V-1/V-3
K2	Chassis Isolation	470mmf 1500V ,.5-1meg	76X11	Centralab HC-478 Sprague AC3-1

RECTIFIERS

ITEM No	RATING CURRENT (Measured)	REPLACEMENT DATA AIRLINE PART No	FEDERAL PART No	GENERAL ELECTRIC PART No	INTERNATIONAL PART No	SARKES TARZIAN PART No.	NOTES
M1	320A	56X19 ①		1N1007 ②	SD-94 ①	40K ①	① Silicon Type
M2	320A	66X19 ①		1N1007 ②	SD-94 ①	40K ①	② Germanium Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA AIRLINE PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M3	1N80 *		1N60	1N295	Video Detector (Pigtail) * Some versions may use a CK706A in this application

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	Tuner	25A169	VHF (Standard Coil Part #FNS-053)
M5	Circuit Breaker	2A475	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO	DESCRIPTION
Safety Glass	17X197-2	
Mask	4X2349-4	
Knob	10A923-1	Channel Selector
Knob	10A924-1	Fine Tuning
Knob	10A921-4	Volume
Knob	10A922-1	Contrast
Knob	10A922-2	Brightness
Handle	8-38A594	
Cabinet	28A573	Top
Cabinet	28A574	Bottom

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8464 (Round) - 4 Conductor 8486 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

AIRLINE MODEL WG-4204A

FOLDER 1

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		13L8DB121K	BPD-00012	DD-121	L10T12	UC-5312	5GA-T12	
C202	30		13M320EA300NH-Z3						
C203	15		13L8GP150K	N750-DI 15	DTN-15	C10Q15U		5TCU-Q15	N750 10%
C204	15		13L8GP150J	BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C205	800		13M320EA801Z-Z3						
C206	2-8		31B-206-07						
C207	47		13M130U470J-01						
C208	2-6		31B-206-01						
C209	800		13M320EA801Z-Z3						
C210	1.0		13D-111-35	NPO-SI 1.0	TCZ-1			5TCCB-V1	①
C211	51		13L10T510K						N470 10%
C212	2-6		31B-206-01						
C213	1000		31J-024	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C214	10		13L8U100D						N470
C215	10		13LUA100D						N1400
C216	1.5			NPO-SI 1.5	TCZ-1R5	C10V15C	ZT-5515	5TCCB-V15	NPO②
C217									
C218	30		13M320EA300NH-Z3						
C219	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C220	800		13M320EA801Z-Z3						

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R201	4700Ω		12TAE472M	
R202	1000Ω		12TAE102M	
R203	10K		12TAE103M	
R204	220K		12TAE224M	

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R205	10K		12TAE103M	
R206	1000Ω		12TAE102M	
R207	10K		12TAE103M	
R208	5600Ω		12TAE562M	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .2-1meg	13P-198	Centralab Sprague	RC-471 R-9197
K202	Antenna Isolation	470mmf, .2-1meg	13P-198	Centralab Sprague	RC-471 R-9197

NOTE: PART NUMBERS LISTED ABOVE ARE "STANDARD COIL" PART NUMBERS.

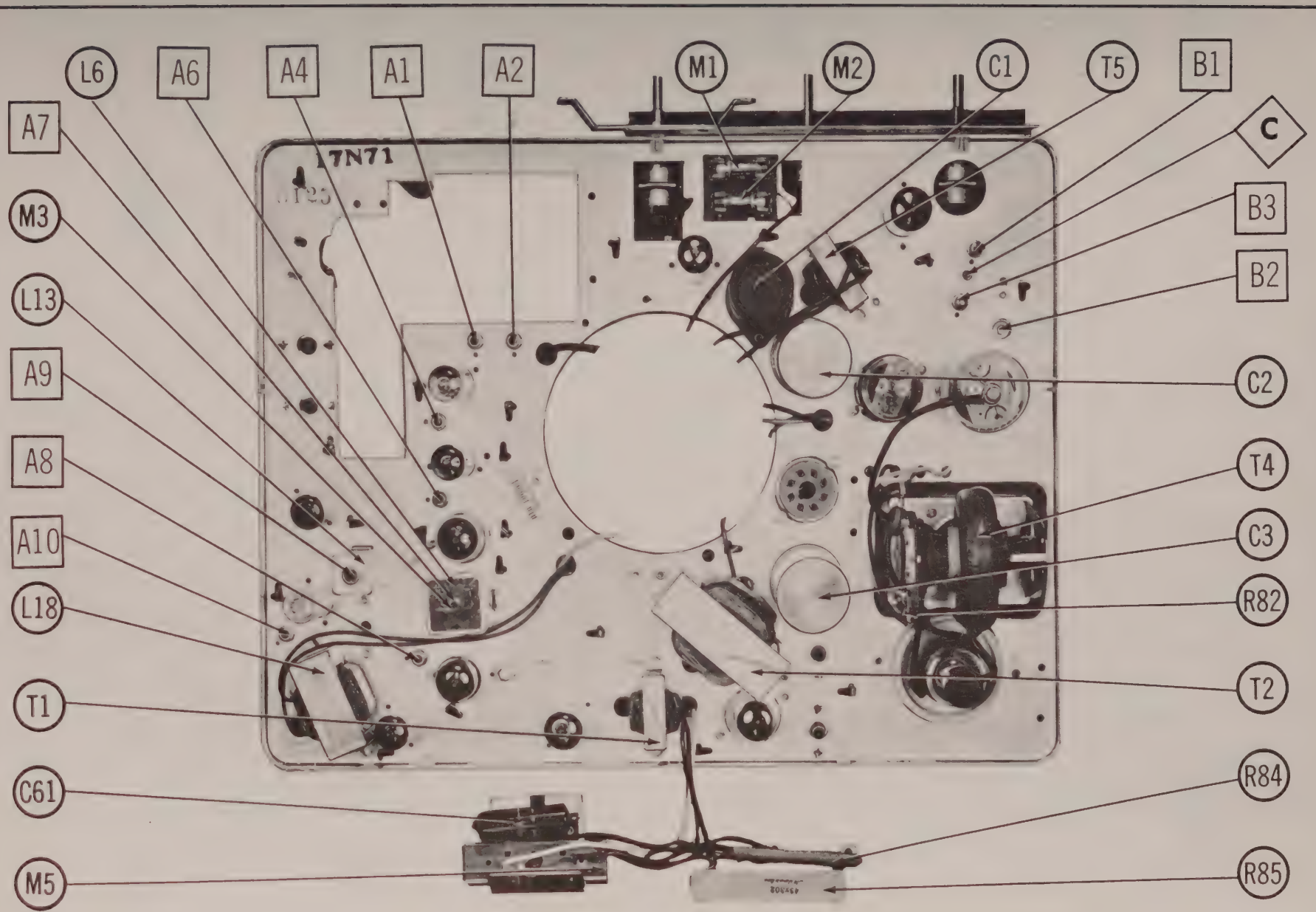
TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supplying power to the receiver. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

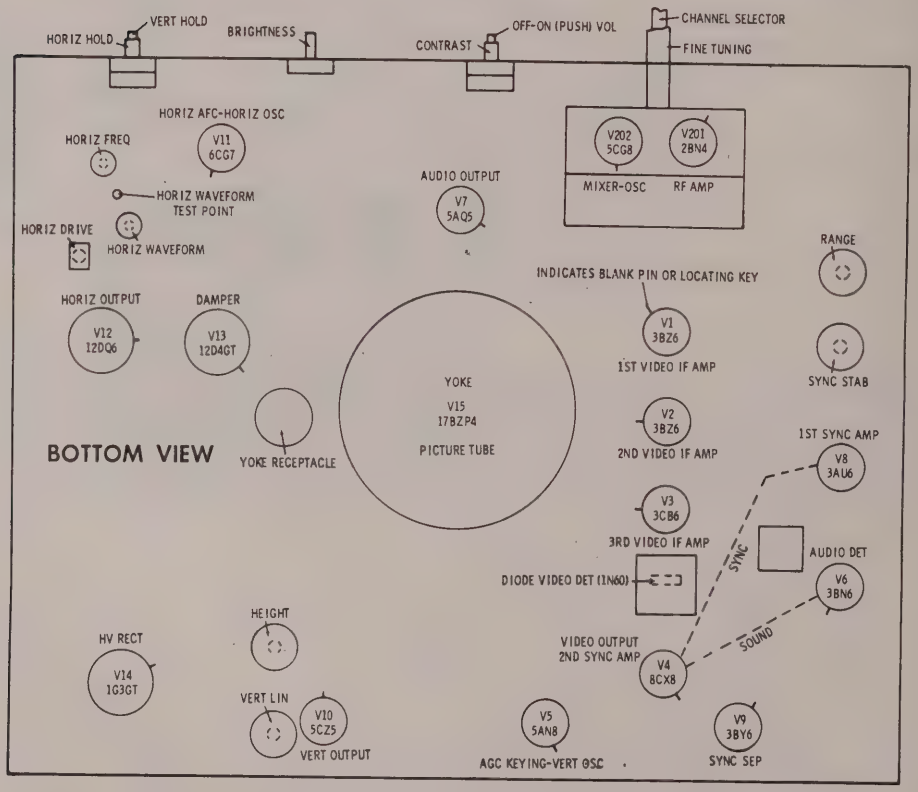


CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	570K	47Ω	17Ω	16Ω	† 2600Ω	† 2600Ω	0Ω		
V2	3BZ6	570K	47Ω	16Ω	15Ω	† 2600Ω	† 2600Ω	0Ω		
V3	3CB6	.1Ω	180Ω	15Ω	14Ω	† 2100Ω	† 2100Ω	0Ω		
V4	8CX8	0Ω	47K	† 49K	12Ω	10Ω	• 320Ω	1200Ω	† 1700Ω	† 5000Ω
V5	5AN8	• ‡ 1.4meg	1.2meg	175Ω	18.5Ω	20Ω	300K	† 0Ω	† 35K	† 1700Ω
V6	3BN6	• 330Ω	106Ω	13Ω	12Ω	† 6400Ω	6.5Ω	† 330K		
V7	5AQ5	0Ω	330Ω	17Ω	18.5Ω	† 880Ω	† 470Ω	0Ω		
V8	3AU6	5000Ω	† 8500Ω	14Ω	13Ω	† 8500Ω	† 8500Ω	0Ω		
V9	3BY6	• 750K	0Ω	21.5Ω	20Ω	† 820K	† 29K	2.2meg		
V10	5CZ5	† 0Ω	NC	270K	21.5Ω	22.5Ω	270K	470Ω	NC	† 430Ω
V11	6CG7	† 56K	410K	0Ω	10Ω	8.5Ω	• † 30K	1.5meg	410K	0Ω
V12	12DQ6	TP	7Ω	TP	† 10K	1meg	TP	4.5Ω	100Ω	TOP CAP ‡ 16Ω
V13	12D4GT	TP	NC	¶ 800K	NC	† .1Ω	NC	4.5Ω	2Ω	
V14	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 371Ω
V15	17BZP4	7Ω	22K	† 100K	† 100K	NC	NC	• 230K	8.5Ω	
V201	2BN4	0Ω	700K	0Ω	.5Ω	† 2700Ω	0Ω	700K		
V202	5CG8	10K	† 7300Ω	0Ω	2Ω	.5Ω	† 2700Ω	† 11K	0Ω	230K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE. NC NO CONNECTION.
‡ MEASURED FROM PIN 3 OF V13. TP TIE POINT.



TUBE PLACEMENT CHART

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the Horizontal Hold fully clockwise. Tune in a station and adjust the Horizontal Frequency (B1) until the picture is just about to tear out of sync (jitter at the top of the picture).

Turn the Contrast fully counterclockwise and the Brightness clockwise so that the picture appears washed out. Turn the Horizontal Drive (B2) clockwise until white vertical bars (drive lines) appears in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of a scope to point Ⓒ . Low side to chassis. Adjust the Horizontal Waveform (B3) until the round and sharp peaks are equal in amplitude. (See Fig. 3). Keep the picture in sync during this adjustment.

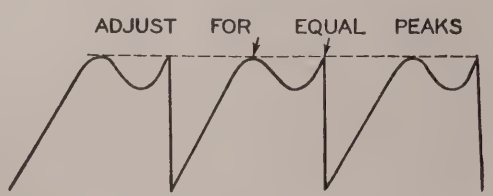


FIG. 3

PHOTOFACT* Folder

with CIRCUITRACE*

EMERSON MODELS 1452, 1453 (Ch. 120424W, 120425Y)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 2 metal screws holding front control knobs metal trim.
2. Remove 6 push-on type front control knobs.
3. Remove 9 metal screws holding rear cover. Remove rear cover.
4. Remove picture tube socket, 2 inter-chassis plugs, high voltage lead, speaker leads and yoke clamp.
5. Remove horizontally mounted power chassis by removing 6 metal screws (bottom) holding chassis to cabinet.
6. Remove power chassis and yoke.
7. Remove 5 metal screws holding vertically mounted printed circuit chassis to cabinet at rear.
8. Remove printed circuit chassis.

MODEL 1452 (Ch. 120424W)

EMERSON MODELS 1452, 1453 (Ch. 120424W, 120425Y)

TRADE NAME	Emerson MODELS 1452 (Ch. 120424W), 1453 (Ch. 120425Y)
MANUFACTURER	Emerson Radio & Phonograph Corp., 14th & Coles Sts., Jersey City 2, N.J.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 170 Watts, 1.64 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF Oscillator it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws holding front control knob metal trim.
Remove 6 front control knobs.
Remove 3 metal screws (bottom, front).
Pull bottom of mask out from cabinet and lift to remove.
NOTE: To clean safety glass use mild soap and water.

SPECIAL ADJUSTMENTS

A. Local-Distance
Observe the picture and advance the Local-Distance control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
No provision is made to vary the focus on this receiver.

C. Width
The width may be varied by means of a shorting jumper across R75 located directly in front of the power transformer.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE

One fuse is used for low voltage supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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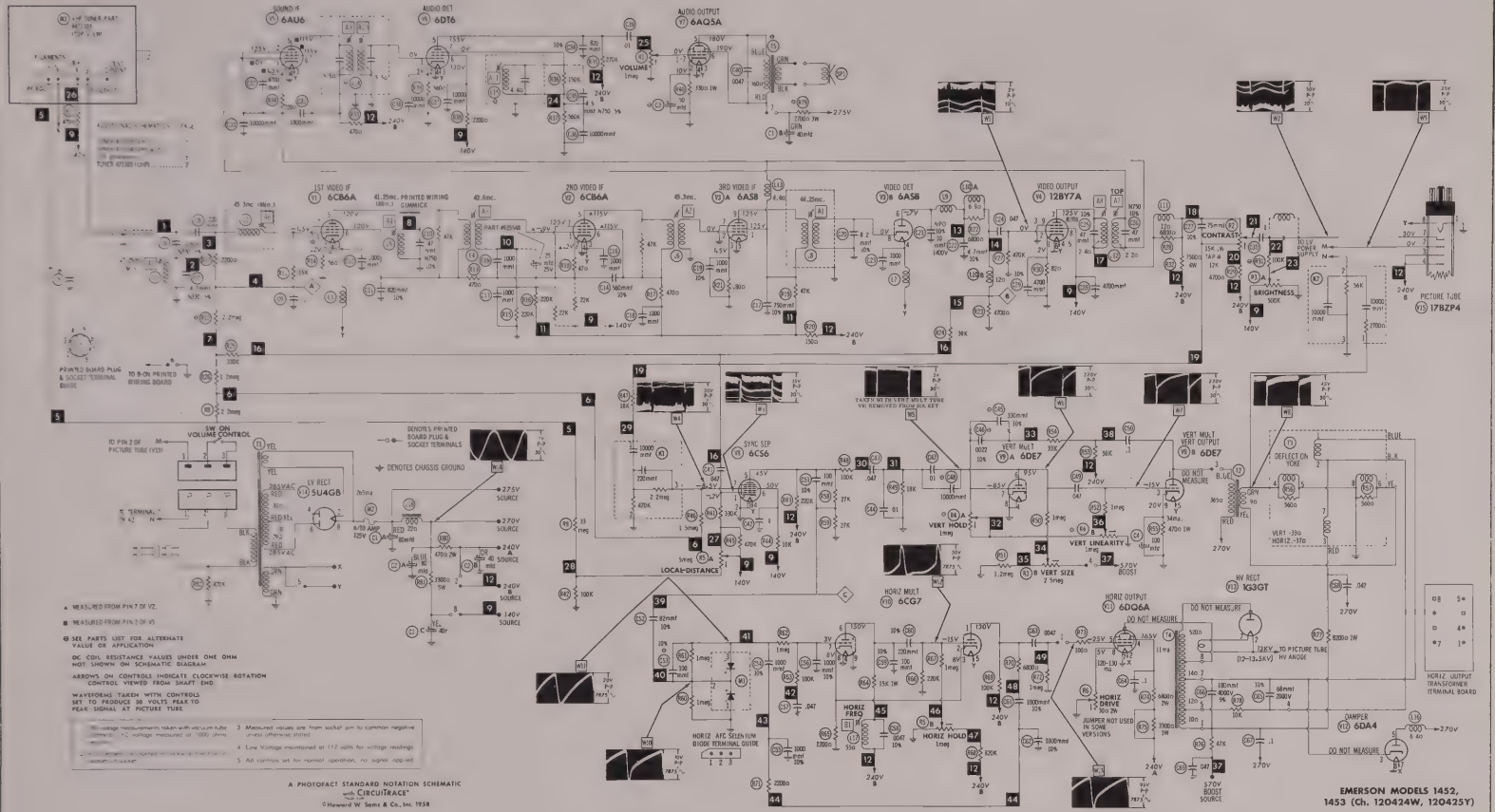
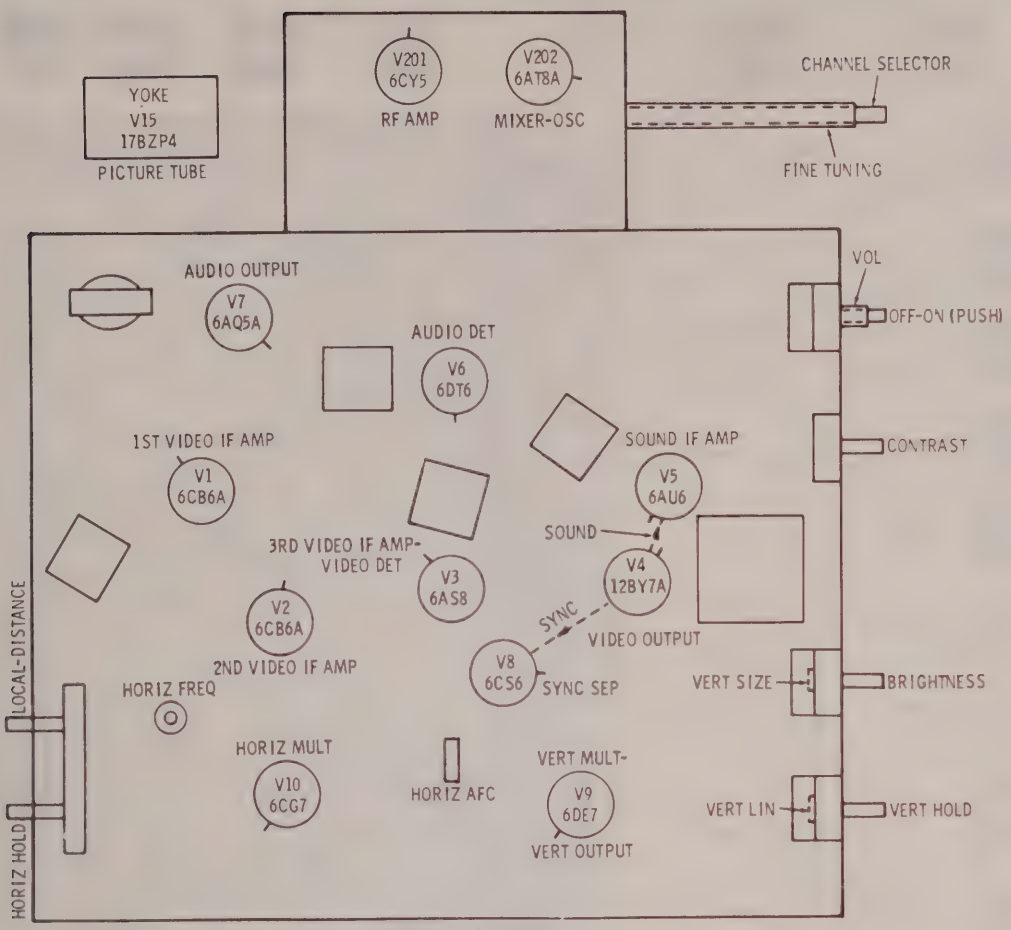
H831

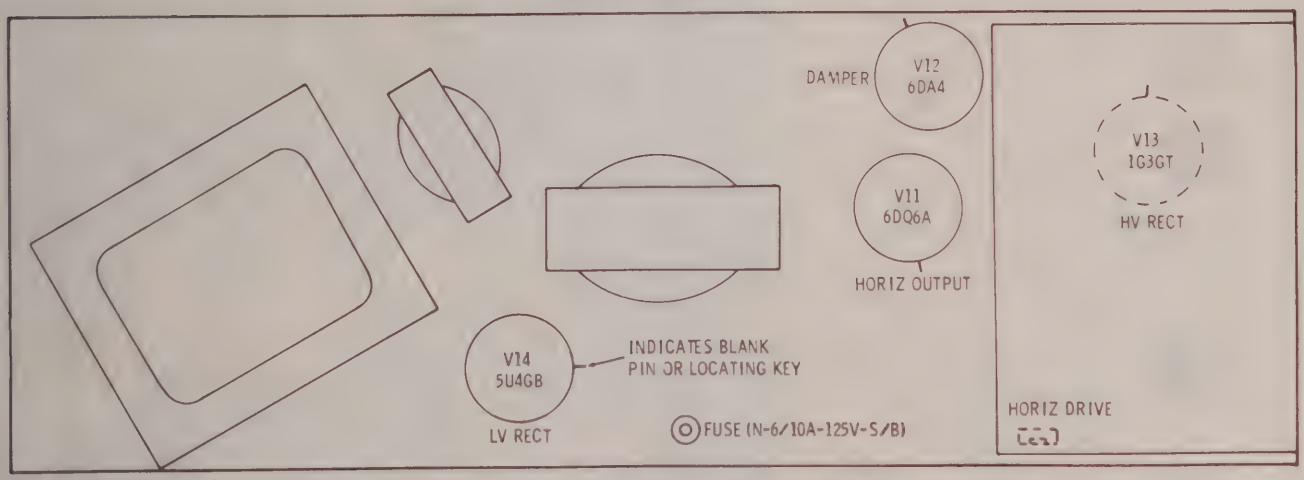
SET 419 FOLDER 2


SOUND IF
6AU6
AUDIO DET
6DT6
AUDIO OUTPUT
6AQ5A
VOLUME
1meg
1ST VIDEO IF
6CB6A
2ND VIDEO IF
6CB6A
3RD VIDEO IF
6AS8
VIDEO DET
6AS8
VIDEO OUTPUT
12BY7A
CONTRAST
BRIGHTNESS
500K
PICTURE TUBE
17BZP4
SYNC SEP
6CS6
VERT MULT
VERT OUTPUT
6DE7
VERT HOLD
1meg
VERT LINEARITY
1meg
VERT SIZE
2.5meg
570V BOOST
DEFLECT ON YOKE
VERT -330
HORIZ -370
HORIZ MULT
6CG7
LOCAL-DISTANCE
1meg
HORIZ AFC SELENIUM DIODE TERMINAL GUIDE
HORIZ FREQ
HORIZ HOLD
1meg
HORIZ OUTPUT
6DQ6A
DO NOT MEASURE
HORIZ DRIVE
50K 2W
JUMPER NOT USED IN SOME VERSIONS
HV RECT
1G3GT
13KV TO PICTURE TUBE HV ANODE
(12-13.5KV)
DAMPER
6DA4
DO NOT MEASURE
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
LV RECT
5U4GB
285VAC
285VAC
SW ON VOLUME CONTROL
TO PIN 2 OF PICTURE TUBE (V15)
TO B-ON PRINTED WIRING BOARD
PRINTED BOARD PLUG & SOCKET TERMINAL GUIDE
DENOTES PRINTED BOARD PLUG & SOCKET TERMINALS
DENOTES CHASSIS GROUND
TAKEN WITH 20 VERT. DEFLT. TUBE (V6) REMOVED FROM SOCKET
A MEAS. RED FROM PIN 7 OF V2.
B MEASURED FROM PIN 2 OF V5
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
©Howard W. Sams & Co., Inc. 1958
EMERSON MODELS 1452, 1453 (Ch. 120424W, 120425Y)

TUBE PLACEMENT CHART



TOP VIEW



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (M2), V14

SWEEP FAILURE
No raster, has sound Rectifier (M1), V10, V11, V12, V13, V15
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, V14
Vert. off freq. V9
Horiz. off freq. V10

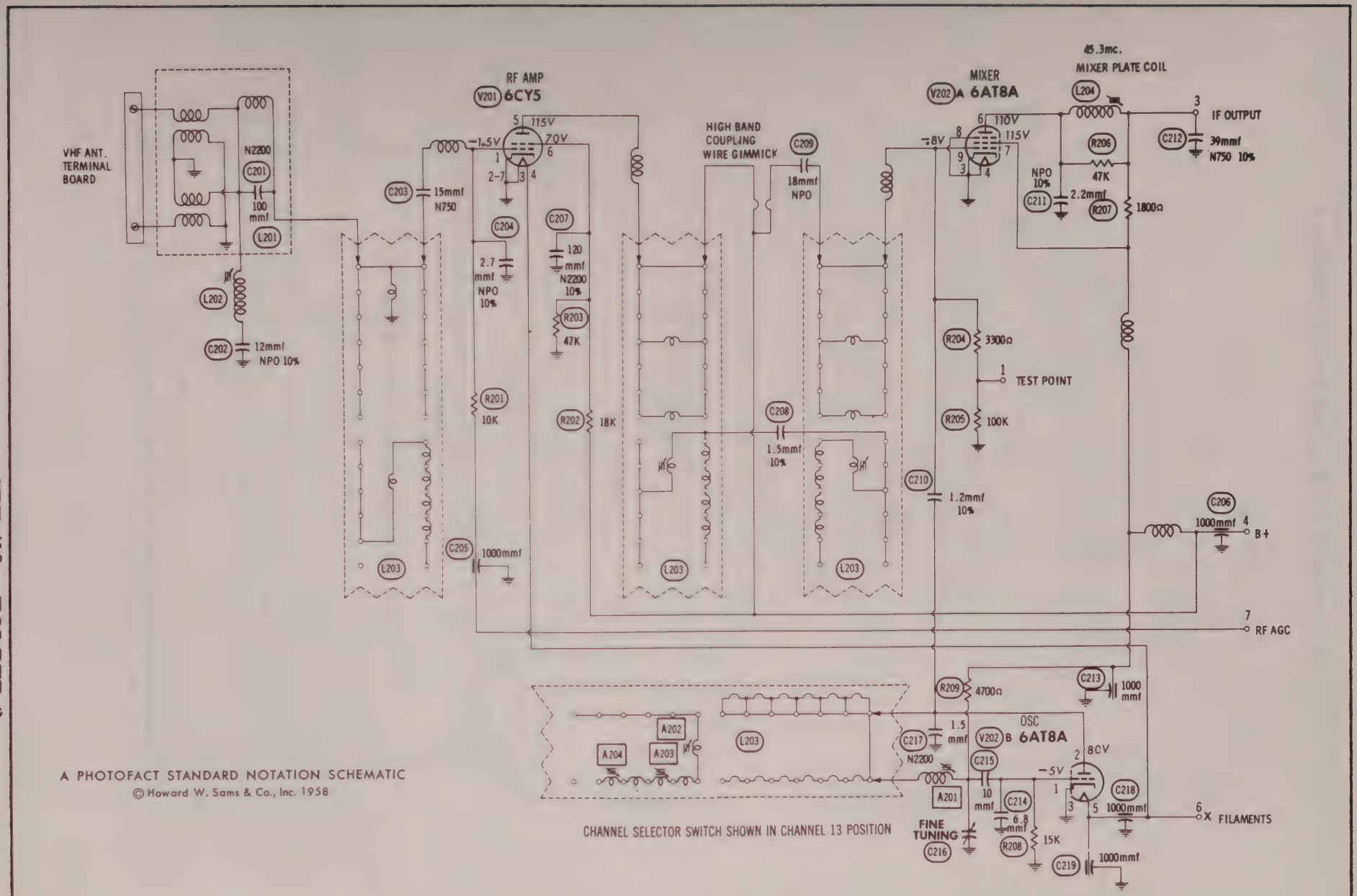
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V8
No horiz. sync V8, M1
No vert. or horiz. sync V8

A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



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VHF TUNER 471103

(Ch. 120424W, 120425Y)

EMERSON MODELS 1452, 1453

TUNER PARTS LIST AND DESCRIPTIONS

471103

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp	6CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6AT8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	100								N2200
C202	12					C10Q12C			NPO 10%
C203	15			N750-DI 15	DTN-15	C10Q15U		5TCC-Q15	N750
C204	2.7								NPO 10%
C205	1000		961969	EF-001	MFT-1000			503C-D1	
C206	1000		961969	EF-001	MFT-1000			503C-D1	
C207	120								N2200 10%
C208	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	10%
C209	18					C10Q18C			NPO
C210	1.2								10%
C211	2.2			NPO-SI 2.2	TCZ-2R2	C10V22C		5TCCB-V22	NPO 10%
C212	39								N750 5%
C213	1000		961969	EF-001	MFT-1000			503C-D1	
C214	6.8			NPO-SI 6.8	TCZ-6R8	C10V68C	ZT-5568	5TCCB-V68	
C215	10			NPO-SI 10	TCZ-10	C10Q1C	ZT-541	5TCC-Q1	
C216									
C217	1.5								N2200
C218	1000		961969	EF-001	MFT-1000			503C-D1	
C219	1000		961969	EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R201	10K			
R202	18K			
R203	47K			
R204	3300Ω			
R205	100K			

ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R206	47K			
R207	1800Ω			
R208	15K			
R209	4700Ω			

COILS (RF-IF)

ITEM No.	USE	EMERSON PART No.	NOTES
L201	Ant. Trans.	962267	Includes trap
L202	IF Trap	962270	
L203	Ant., RF, Mixer Grid, Osc. Coils	962268	Channel 2-13, Includes shaft & Switch Assy.

ITEM No.	USE	EMERSON PART No.	NOTES
L204	Mixer Plate Coil	962269	

TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

Channel 13 oscillator adjustment slug (A201)is also used for adjusting the other high band (12 thru 7) channels. Channel 6 oscillator adjustment slug (A202) is also adjusted for channel 5. Channel 4 oscillator adjustment (A203) is also adjusted for channel 3. Channel 2 oscillator slug (A204) is used only for channel 2.

Turn the set on and tune in the highest high band channel and adjust control for normal operation. Set Fine Tuning to the center of its range . Adjust A201 for best picture and sound. Switch to next high band channel. If necessary to adjust, do so by bending coil loop appearing at the hole to left of tuner shaft for best picture and sound.

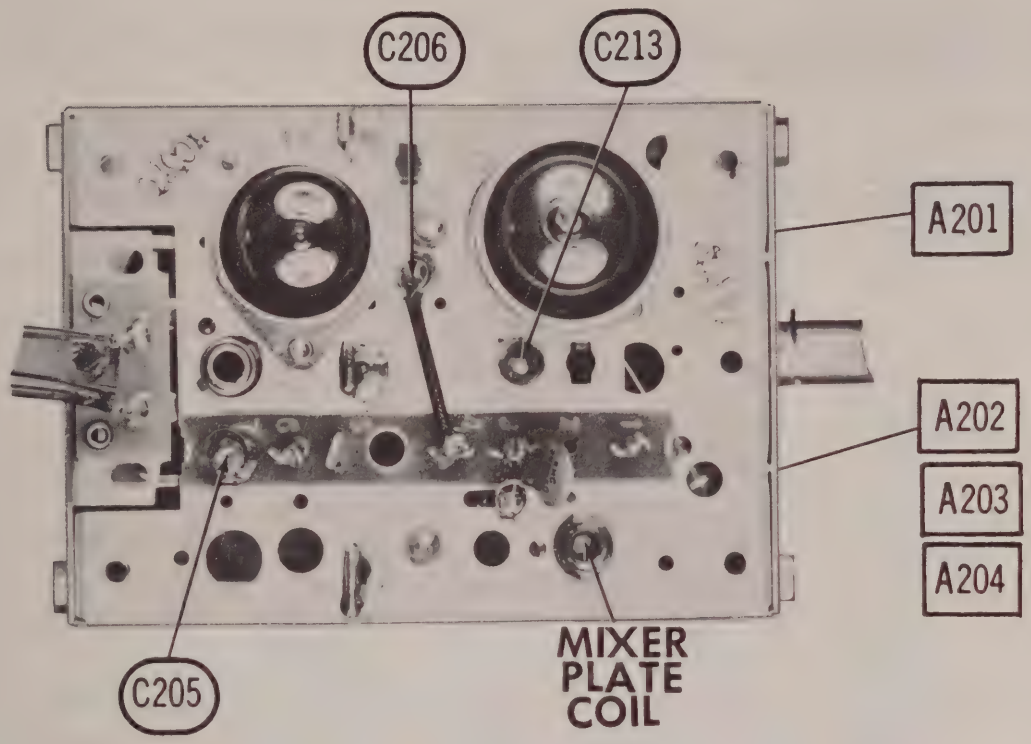
Switch Channel Selector to the highest low band channel (6 thru 2) operating in the area. Adjust proper slug for best picture and sound. If channel 5 or 3 need adjusting, it will be necessary to switch to the next higher channel, adjust slug SLIGHTLY, then switch back to the channel needing adjustment and check picture. Repeat until proper results are obtained. Repeat procedure until all channels operating in the area have been properly adjusted.

RF AND MIXER ALIGNMENT

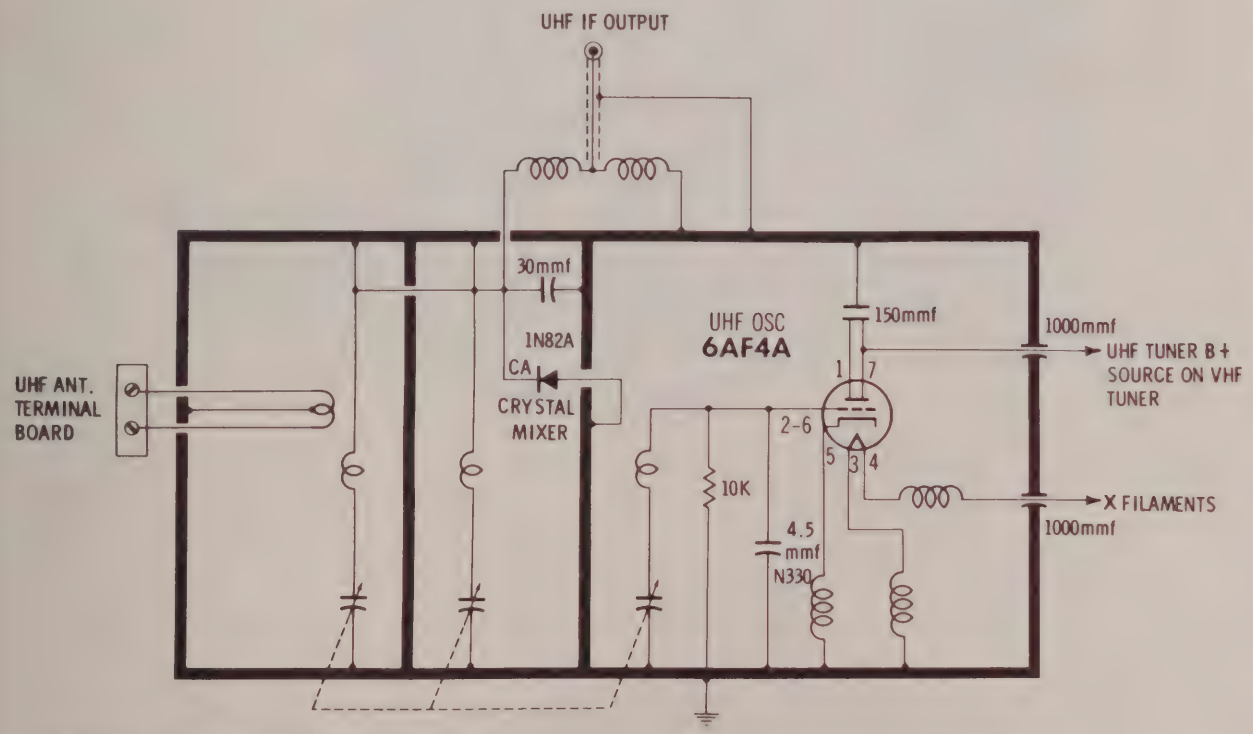
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



TUNER 471103 - TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER 471105

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools for all slugs (12) ..... General Cement #8282, 8606, 8606L or 9295.
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Set the "Local-Distance" fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	44.25MC	Any non-interfering channel	USE VTVM. DC probe to point (B). Common to chassis. (Across Video Det. load)	A1	Adjust for maximum deflection.
2.	"	"	"	45.3MC	"	"	A2	"
3.	"	"	"	42.6MC	"	"	A3	"
4.	"	"	"	41.25MC	"	"	A4	Adjust for MINIMUM deflection.
5.	"	"	"	47.25MC	"	"	A5	"
6.	"	"	"	45.3MC	"	"	A6	"
7.	"	"	"	45.3MC	"	"	Mixer Plate Coil	Adjust for maximum deflection.
8.	"	"	"	43.1MC	"	"	A6	Readjust for maximum deflection.
9.	"	"	45.0MC (10MC Swp)	45.75MC 47.25MC	"	USE SCOPE. Vert. Amp. thru 10K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary, repeat steps 1 thru 8.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and adjust the Fine Tuning so that a 4.5MC beat pattern is visible in the picture. Adjust A7 for MINIMUM beat interference in the picture.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust A8, A9 and A10 for maximum volume. Adjust A11 for maximum undistorted sound. If two peaks are obtained, use the one with the slug nearest the circuit board. With the antenna loosely coupled to the receiver to provide a weak signal, retouch A8, A9 and A10 for maximum undistorted sound.
Check sound on all available channels and if necessary, repeat sound alignment.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

FIG. 1

PRINTED BOARD–CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6CB6A	
V2	2nd. Video IF Amp.	6CB6A	
V3	3rd. Video IF Amp. - Video Det.	6AS8	
V4	Video Output	12BY7A	
V5	Sound IF Amp.	6AU6	
V6	Audio Det.	6U8A	
V7	Audio Output	6AQ5A	
V8	Sync Sep.	6U8A	
V9	Vert. Mult.-Vert. Output	6U8A	
V10	Horiz. Mult.	6CU7	
V11	Horiz. Output	6LQ6GA	
V12	Damper	6U4A	
V13	HV Rectifier	1X2A	
V14	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	EMERSON PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	170Z24	17CSP4	17BZP4	17BZP4	1 Aluminized 2 Silvermatic 3 "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C3A	80	350	925437	PR4-450	BRRT0485 BR4035			R2730 *	
B	40	300							
C	40	300							
C3A	80	350	925438	PR3-030	BRRT0485			TVA-3712	
B	40	300							
C3	30	25	925441 1	PR325V5	BRR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C4	30	50	925442	PR350V100	BR1305	TC3501	TD-100-50	MTH-5010	TVA-1310

* Not available in distributor's stock, available through distributor on order to manufacturer.
1 Alternate Part 925G67.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C5	.1	200	926804X	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	2	
C6	10		926801X		TCA-10					N330 5%
C7	6.7		926802X							N330 5%
C8	220		926903X	BPD-00032	DD-22S	L10T2S	JL-322	5GA-T22		
C9	.1	200	923127	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1		
C10	47		926900X	NT50-DZ 47	DTN-47	C10Q47U	CNT-447	5TCU-Q47		N750 10%
C11	220		926904X				JL-322			10%
C12	1000		926933X	BPD-001	DD-102	BYA5DI	B-2D	5HK-D1		
C13	1000		926933X	BPD-001	DD-102	BYA5DI	B-2D	5HK-D1		
C14	500		926906X		MD-561		JL-356			10%
C15	1000		926933X	BPD-001	DD-102	BYA5DI	B-2D	5HK-D1		
C16	1000		926933X	BPD-001	DD-102	BYA5DI	B-2D	5HK-D1		
C17	750		926960X				JL-375			10%
C18	1000		926933X	BPD-001	DD-102	BYA5DI	B-2D	5HK-D1		
C19	1000		926913X				JL-2D			10%
C20	8.3		926975X	NPO-DI 8.3	MD-8S3	C30Y8SC				NPO 10%
C21	10	1600	926956X							NPO 10%
C22	6.7		963974X	NPO-DI 6.7	MD-6S7	C30Y6SC	CNO-847	5TCCB-V47		10%
C23	1000		926933X	BPD-001	DD-102		B-2D	5HK-D1		
C24	.047	200	923254	P288N-047	DF-503	CUB2S47	GEM-4147	4TM-S47		
C25	47		926900X	NT50-DZ 47	DTN-47	C10Q47U	CNT-447	5TCU-Q47		N750 10%
C26	47		926900X	NT50-DZ 47	DTN-47	C10Q47U	CNT-447	5TCU-Q47		N750 10%
C27	75		926976X	NPO-DZ 75	DTZ-75	C10Q75C		5TCC-Q75		10%
C28	4700		926933X	BPD-0047	DD-472	BYA10D47M	B-3D7	5HK-D47		
C29	4700		926822X				JL-347			10%
C30	.1	600	923215	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1		
C31	1000		926907X				JL-2D			10%
C32	4700		926922X	BPD-0047	DD-472	BYA10D47M	B-3D7	5HK-D47		
C33	10000		926934X	BPD-DI	DD-103	BYA10DI	B-1D	5HK-S1		
C34	500		926908X				JL-342			10%
C35	4.5		926992							N750 5%
C36	10000		926934X	BPD-DI	DD-103	BYA10DI	B-1D	5HK-S1		
C37	10000		926934X	BPD-DI	DD-103	BYA10DI	B-1D	5HK-S1		
C38	10000		926935X	BPD-DI	DD-103	BYA10DI	B-1D	5HK-S1		
C39	.01	600	923464	P488N-01	DF-103	CUB4D	GEM-401	4TM-S2		
C40	.0047	600	921753	P488N-0047	DF-502	CUB5D47	GEM-5247	5TM-D47		
C41	.047	600	923126	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C42	.1	600	923213	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1		
C43	.047	600	923254	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C44	.01	600	923216	P488N-01	DS-103	CUB4SE	GEM-411	4TM-S2		
C45	330		926909X	1686-0033	MD-331	3S3733		MS-333		10% 2
C46	.0022	600	923151							10% 3
C47	.01	600	923216	P488N-01	DS-103	CUB4SE	GEM-411	4TM-S2		
C48	10000		926968X	BPD-DI	DD-103	BYA10DI	B-1D	5HK-S1	2	
C49	.047	600	923254	P488N-01	DF-503	CUB4S47	GEM-4147	4TM-S47		
C50	.1	600	923215	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1		
C51	100		926902X	NPO-DI 100	DTZ-100	C10T1C	CNO-310	5TCC-T1		10%
C52	82		926977X		DTZ-82	C10Q82C	CNO-482			10%
C53	100		926902X	NPO-DI 100	DTZ-100	C10T1C	CNO-310	5TCC-T1		10% 3
C54	1000		926913X				JL-2D			10%
C55	1000		926913X				JL-2D			10%
C56	1000		926961				JL-2D			10%
C57	.047	600	923254	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C58	.0047	600	923125				GEM-16247			10%
C59	100		925039	1689-0001	DD-101	L10T1	MCB235	MS-31		10%
C60	250		926943	1689-00023	DD-22S	L10T2S		MS-322		10%
C61	1000		926913X				JL-2D			10%
	1000		926913X				JL-2D			10%
C62	.047	600	923253	P488N-0047	DS-472	CUB5D47	GEM-5247	5TM-D47		
C63	.1	600	924825	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1		
						HVA20Q68		20GA-Q68		10%
C64	68	2000	928936							5%
C65	180	6000	928965							
C67	.1	600	924725	P488N-1	DF-104	CUB4P1	GEM-601	6TM-P1		
C68	.047	600	924754	P488N-047	DF-503	CUB5S47	GEM-6147	6TM-S47		
C69	.047	600	924754	P488N-047	DF-503	CUB5S47	GEM-6147	6TM-S47		

1 Some versions may use .047mfd 200V in this application (Part #923127).
2 Not used in some versions.
3 Some versions may use .0025mfd (Part #923124), others may use .0033mfd 1KV (Part #923132) in this application.
4 Some versions may use 15000mmf in this application Part #928999X).
5 Some versions may use 82mmf in this application Part #928977X)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	1	390545				● UB3884	Volume & Push Type Switch
R2	15K	1	390546					Contrast, Tap @ 12K
R3A	500K	1	390547				■ UB3886	Brightness
B	2 5meg							Vert. Size
R4A	1meg		390548					Vert. Hold, Note 1
B	1meg							Vert. Lin., Note 1
R5A	5meg		390549					Local-Distance
B	1meg							Horiz. Hold
R6	39Ω	2 WW	390544		39-50			Horiz. Drive

● "ETA-LOC" Equivalent FB56L, OB18T, RU55L, IR3000
■ "ETA-LOC" Equivalent. FA56L, OB18T, RU56L, IR437.
Note 1. Some versions may use 1.5meg Vert. Hold, 500K Vert. Lin. (Part #390581).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		EMERSON PART No	NOTES
	OHMS	WATT		
R7	470Ω		350412	
R8	2 2meg		341292	
R9	33meg		397126	
R10	220Ω		340572	
R11	5K		340772	
R12	2 2meg		341292	Note 1
R13	470Ω		350412	
R14	58Ω		340192	
R15	220K		341052	
R16	220K		341052	
R17	470Ω		350412	
R18	47Ω		340172	
R19	47K		340892	
R20	150Ω		350292	
R21	180Ω		340312	
R22	5800Ω		340692	
R23	4700Ω		340652	
R24	39K		340872	
R25	330K		341092	
R26	1.5meg		341232	
R27	470K		351132	
R28	68000		340832	
R29	4700Ω		340852	
R30	82Ω		340322	
R31	100K		340972	Note 2
R32	75000Ω	4	397125	
R33	4700		350412	
R34	220Ω		340332	
R35	270K		341072	
R36	150K		341012	
R37	560K		341152	
R38	22000Ω		340572	
R39	560Ω		340432	
R40	330Ω	1	370372	
R41	330K		341092	
R42	100K		340972	
R43	220K		351052	
R44	10K		340732	

ITEM No	RATING		EMERSON PART No	NOTES
	OHMS	WATT		
R45	470K		351132	
R46	1.5meg		341252	
R47	18K		340792	
R48	100K		340972	
R49	18K		340792	
R50	1meg		341212	
R51	1 2meg		341232	
R52	1meg		341212	
R53	56K		340912	
R54	33K		340853	
R55	470Ω	1	380412	
R56	560Ω		340432	
R57	560Ω		340432	
R58	27K		340832	
R59	27K		340832	
R60	1meg		341212	
R61	1meg		341212	
R62	1meg		341212	
R63	100K		340972	
R64	15K	1	370772	
R65	1200Ω		340512	
R66	330K		341092	
R67	1meg		341212	
R68	330K		341198	
R69	100K		340972	
R70	5600Ω		340692	
R71	2200Ω		340672	
R72	1meg		341212	
R73	100Ω		350252	
R74	68000	3	780692	
R75	2300Ω	1	370612	
R76	47K		340932	
R77	6200Ω	1	370712	
R78	10K		340732	
R79	2700Ω	3		Note 3
R80	4700	3	780412	
R81	2300Ω	5	394206	
R82	470K		351153	

Note 1. Some versions may use 820K in this application (Part #341192).
Note 2. Some versions may use 82K in this application (Part #340832).
Note 3. Some versions may use 1500Ω 3W in this application (Part #397117).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	47.35MC Trap	720317					
L2	Ist. Video IF	720316					
L3	Fil. Choke	705031	19-1000	BC-561	4602		1.1 Microhenries
L4	2nd. Video IF	720318					
L5	41.25MC Trap	720315					
L6	3rd. Video IF	720318					
L7	Fil. Choke	705031	19-1000	BC-561	4602		1.1 Microhenries
L8	4th. Video IF	720318					
L9	RF Choke	708371	19-1003	BC-564	4606		4.6 Microhenries
L10A	Series Peaking Coil	708346					100 Microhenries
B	Shunt Peaking Coil						250 Microhenries
L11	Series Peaking Coil	708349					220 Microhenries
L12A	4.5MC Trap	720297					
B	Ist. Sound IF						
L13	RF Choke	705034	19-1004	BC-566	4610		6.8 Microhenries 1
L14	2nd. Sound IF	720323					2
L15	Quadrature Coil	720299					3
L16	RF Choke	705031	19-1005	BC-566	4612		10 Microhenries 2

1 IRC Part #CLA. 2 Alternate Part #720337. 2 Alternate Part #720336. 4 IRC Part #CL-1.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI	SEC	EMERSON PART No.	Messner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
LA7	55Ω		716121						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~/1	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L18	.250A	32Ω	.5 Hy.	737030			F-801 1		26C44 2	C-27X

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI	SEC 1	SEC 2	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V & 1.64A	520VCT & .260A	5V & 2.65A	730078		P-3080			26E47	
	SEC 3	SEC 4	SEC 5							
	6.3V & 7.7A									

1 Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		EMERSON PART No	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Output	738156					A-8142 1		A-108X
T3A	Yoke-Horiz. (20MH)	708344						Y-53 2	
B	(10W)-Vert. (31MH)								
	Rear Cover & Centering Device	708340							
	Yoke Clamp	567186							
T4	Horiz. Output	738155							

1 Drill new mounting hole(s).
2 Remove 37mmf from terminals #2 and #7, remove jumper from terminals #1 and #3, connect same as original, and use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI	SEC	EMERSON PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T5	5200Ω	3-4Ω	734168 1		A-3026 2			24B48 2	S-8X 2	

1 Alternate Part #734172. 2 Use original chassis frame.

SPEAKER

ITEM No	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP	EMERSON PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	180154	4A1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EMERSON PART No.	REPLACEMENT DATA
K1	Sync Coupling	220mmf, 10000mmf, 470K, 2.5meg	923059	
K2	Vert. Blanking	10000mmf, 10000mmf, 2700Ω, 56K	923057	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	EMERSON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1		517074	K615	SD-H 1		1 Silicon type (2 used).

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMERSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	N	8/10A 125V 8/B	808015		333,600 (N-8/10A-125V-8/B)	346010	N 8/10	HN 1/3 to 3/4

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuner	471103	VHF Ch. 1304247
	Tuner	471104	VHF, With UHF Provisions, Ch. 1304257
	Tuner	471105	UHF Ch. 1304257
	Printed Board	471093	Complete with components, Less tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

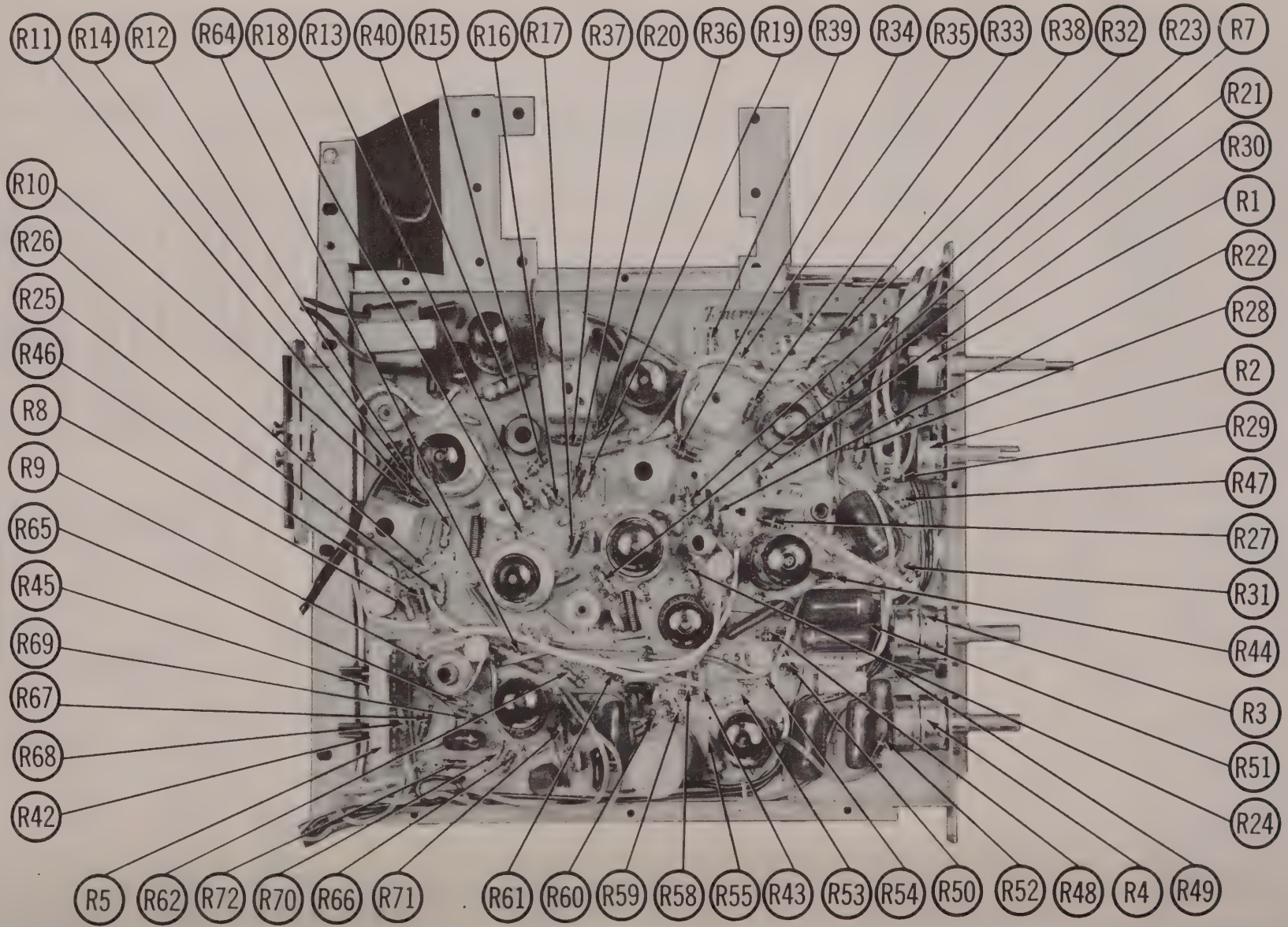
NAME	PART NO.	DESCRIPTION
Safety Glass	460985	
Knob	460969	VHF Selector, Combination, Model 1453
Knob	460785S	Fine Tuning
Knob	460991	UHF Tuning, Model 1453
Knob	460999	VHF Selector
Knob	460990	UHF Dial, Model 1453
Knob	461043	Contrast, Brightness, Vert. Hold, Volume
Handle	595025	
Antenna	471090	

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8574
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8276
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

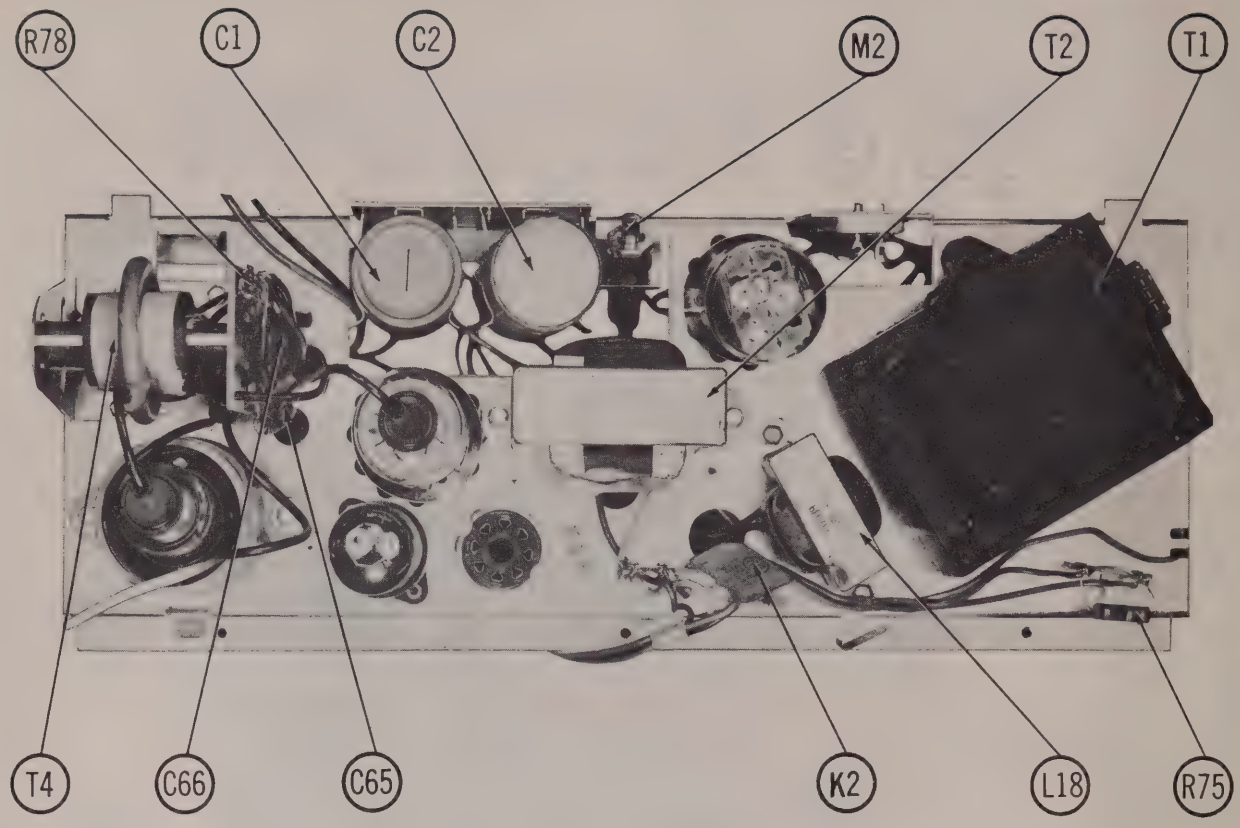
EMERSON MODELS 1452, 1453 (Ch. 120424W, 120425Y)

FOLDER 2

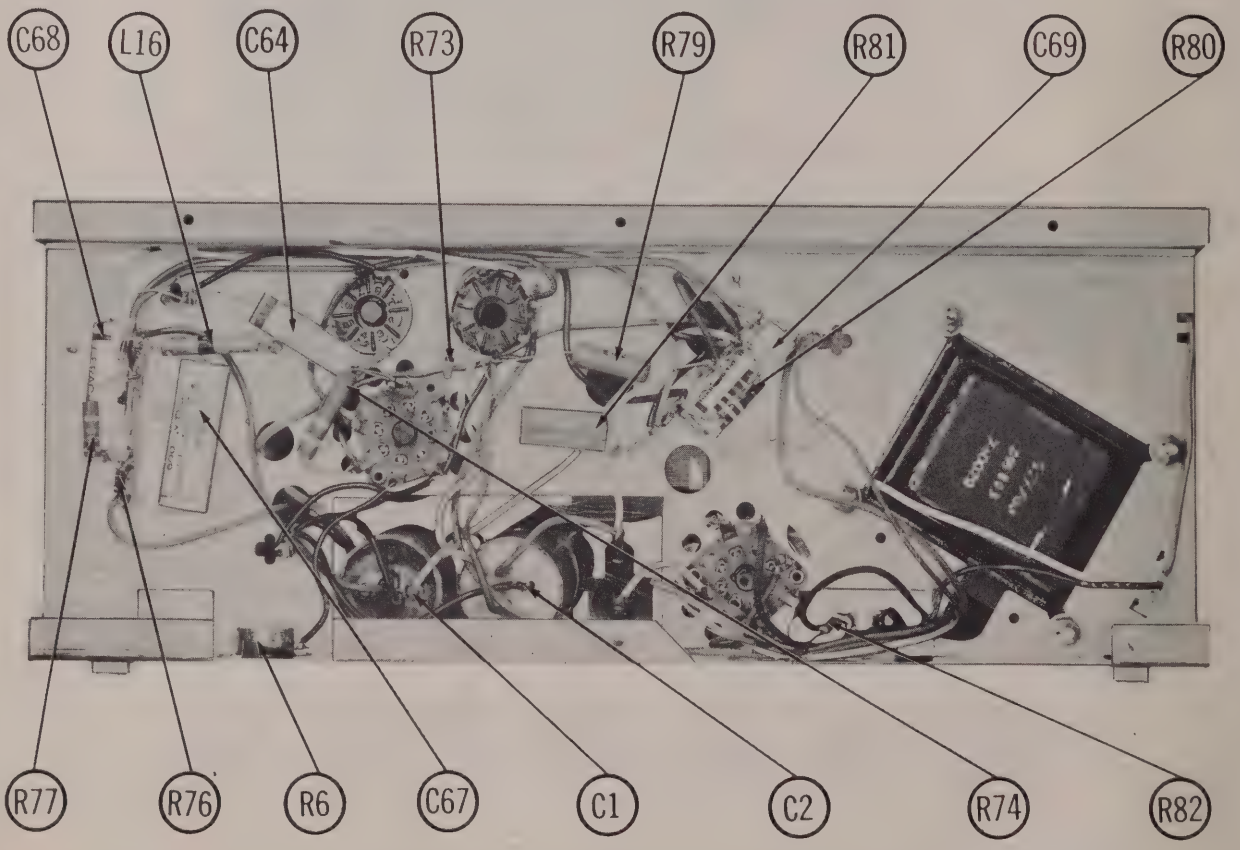


PRINTED BOARD-RESISTOR IDENTIFICATION

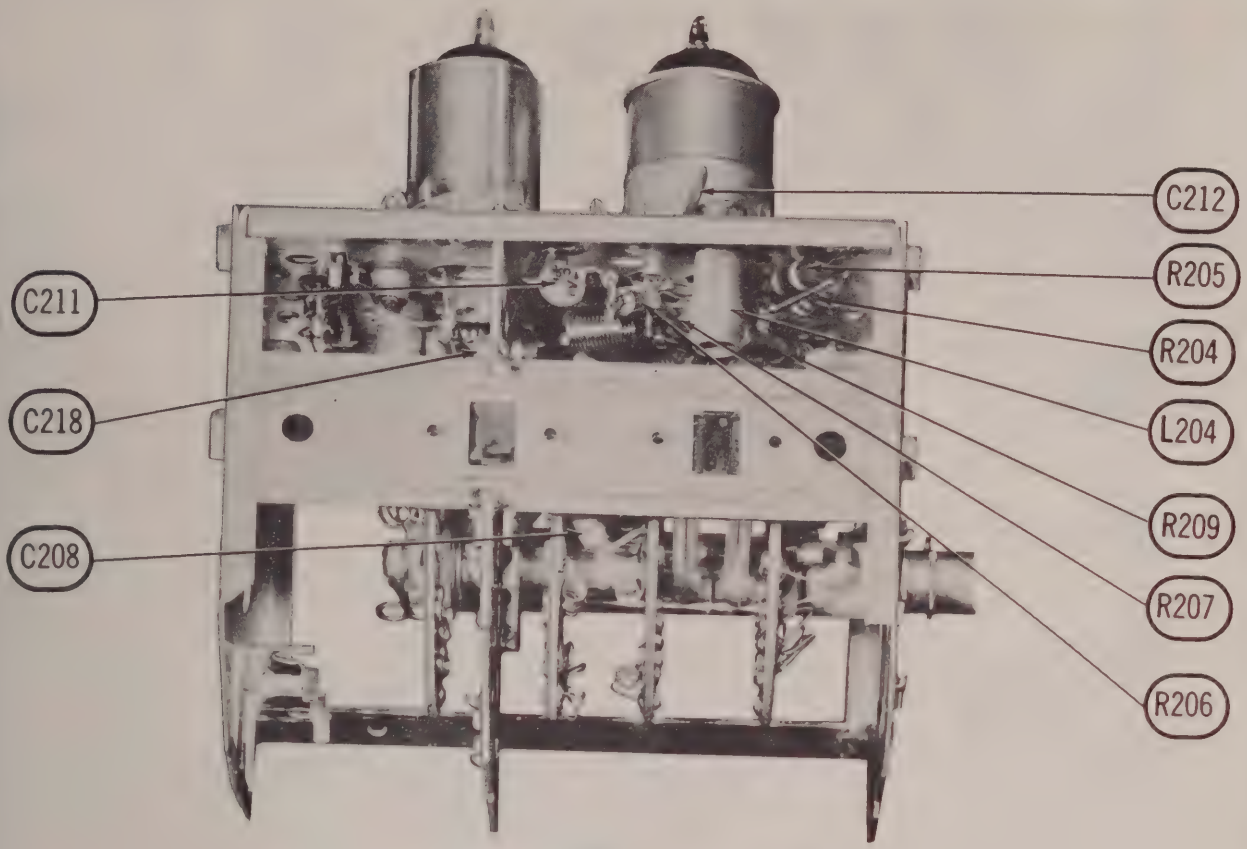
PRINTED BOARD-ALIGNMENT, INDUCTOR IDENTIFICATION



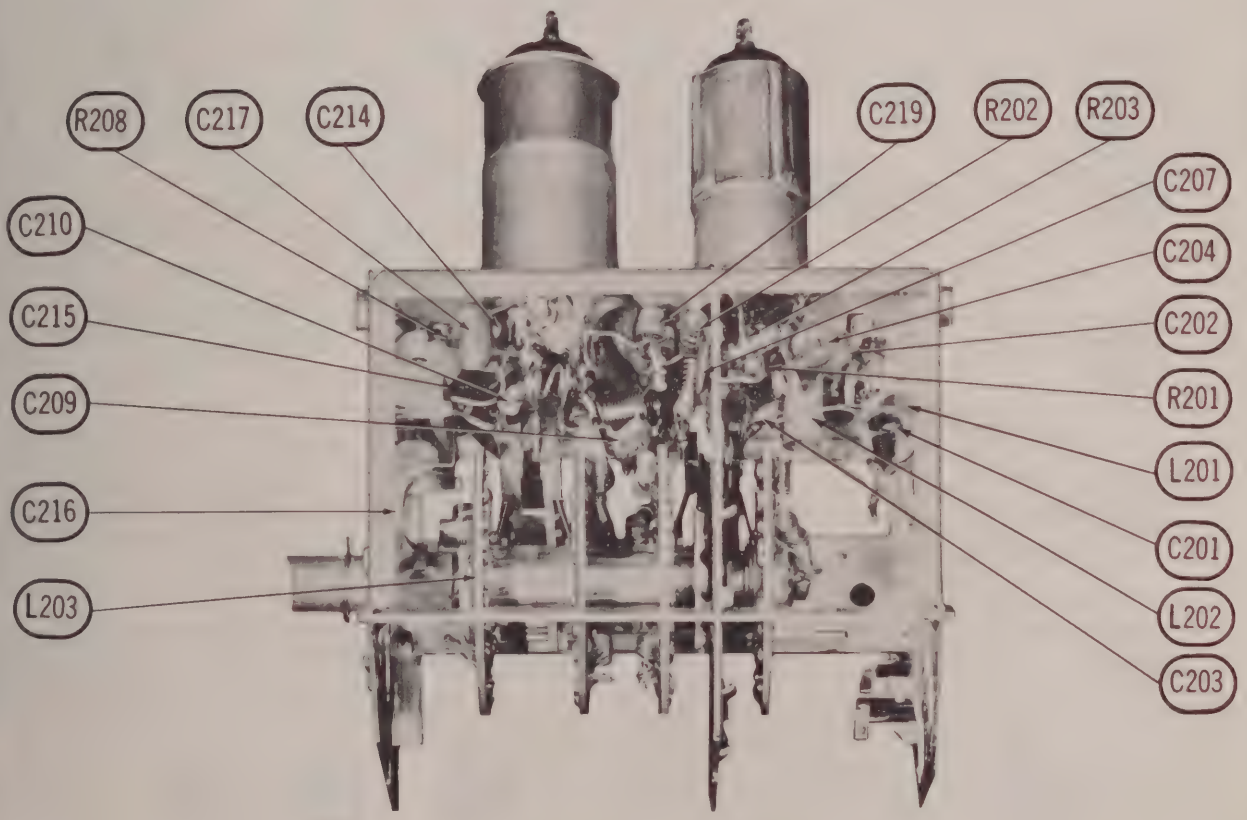
POWER CHASSIS - TOP VIEW



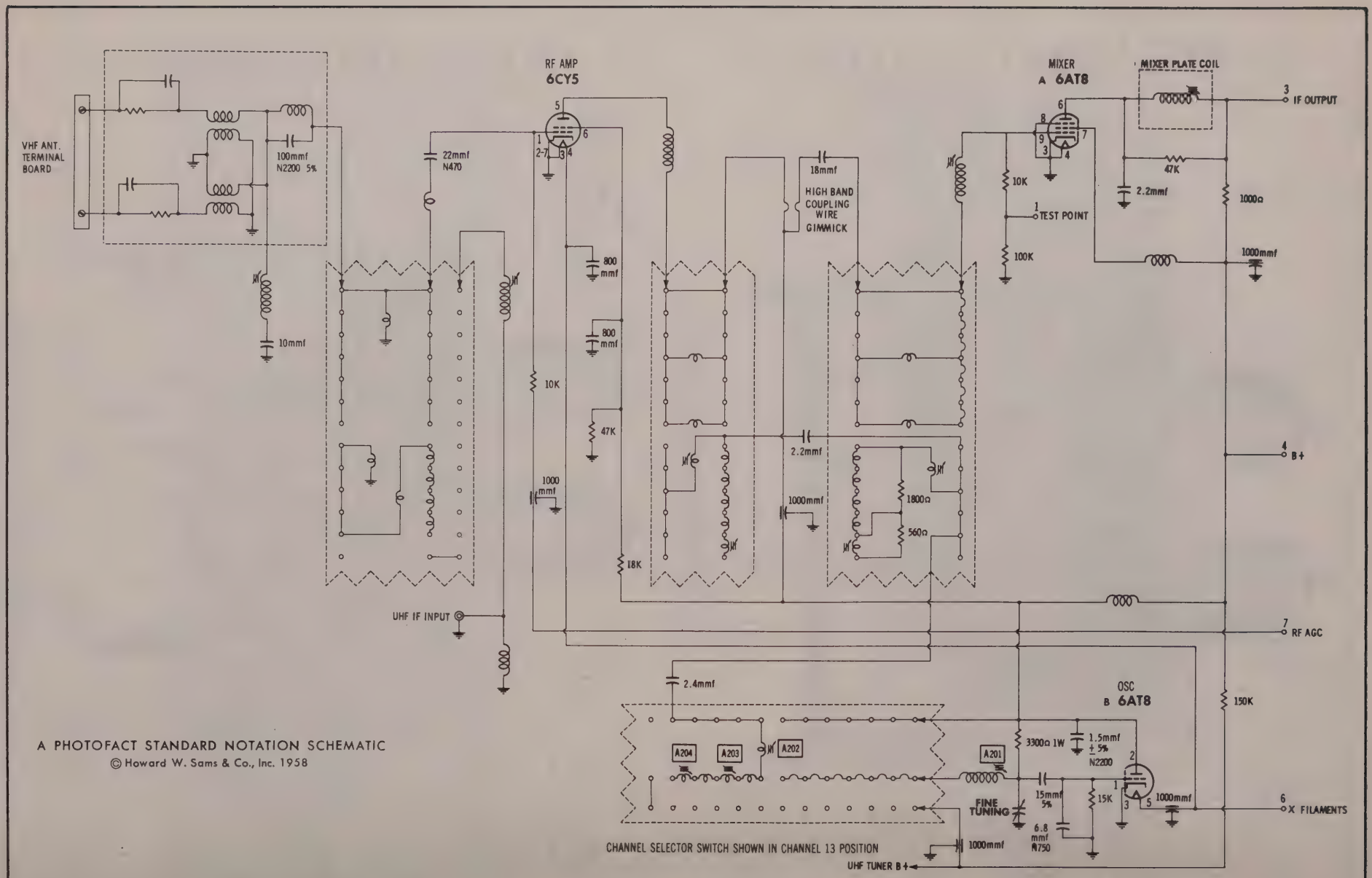
POWER CHASSIS - BOTTOM VIEW



TUNER 471103 - LEFT SIDE



TUNER 471103 - RIGHT SIDE



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VHF TUNER W/UHF PROVISIONS 47110-4

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6A	2.5meg	56Ω	.1Ω	0Ω	▲ 470Ω	▲ 470Ω	0Ω		
V2	6CB6A	110K	▲47Ω	.1Ω	0Ω	†1100Ω	†1100Ω	INF		
V3	6AS8	†47K	.1Ω	180Ω	.1Ω	0Ω	4700Ω	0Ω	.1Ω	†47K
V4	12BY7A	82Ω	470K	0Ω	.1Ω	.1Ω	0Ω	†5500Ω	†3300Ω	0Ω
V5	6AU6	■ 2.2Ω	60K	.1Ω	0Ω	†940Ω	†940Ω	■ 220Ω		
V6	6DT6	5.5Ω	560Ω	.1Ω	0Ω	†270K	†6500Ω	560K		
V7	6AQ5A	0Ω	330Ω	.1Ω	0Ω	†3000Ω	†2700Ω	0Ω		
V8	6CS6	†600K	0Ω	0Ω	.1Ω	45K	†13K	1.3meg		
V9	6DE7	†365Ω	• 1.2meg	• 1.2meg	0Ω	.1Ω	•‡2.5meg	•1.4meg	0Ω	470Ω
V10	6CG7	†100K	• 180K	1200Ω	0Ω	.1Ω	†15K	2meg	1200Ω	0Ω
V11	6DQ6A	TP	.1Ω	NC	†6800Ω	1meg	NC	0Ω	• 23Ω	TOP CAP ‡14Ω
V12	6DA4	NC	NC	2.8meg	NC	†6.4Ω	NC	.1Ω	0Ω	
V13	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡534Ω
V14	5U4GB	NC	¶	TP	30Ω	NC	29Ω	NC	¶	
V15	17BZP4	0Ω	56K	†470Ω	†470Ω	NC	NC	•170K	.1Ω	
V201	6CY5	2.7meg	0Ω	0Ω	.1Ω	†3800Ω	†17K	0Ω		
V202	6AT8A	15K	†8300Ω	0Ω	0Ω	.1Ω	†5600Ω	†3800Ω	0Ω	100K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

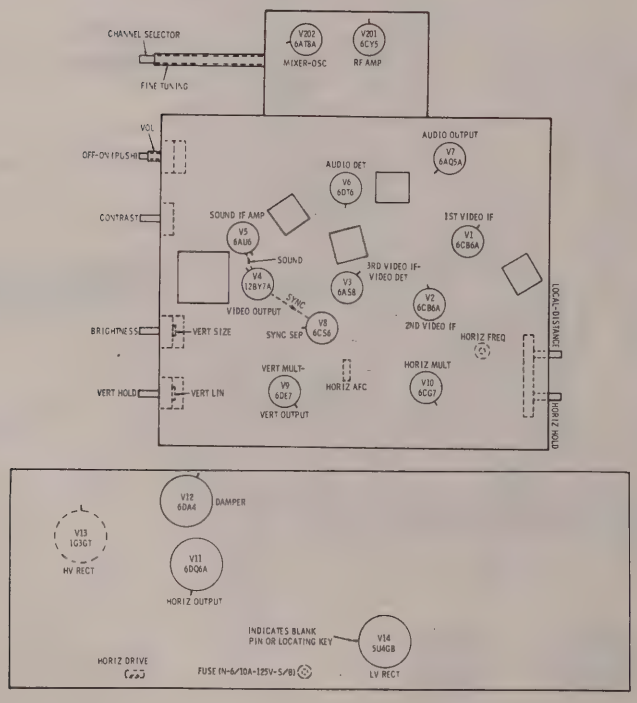
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM 270V SOURCE. ■ MEASURED FROM PIN 2 OF V5.

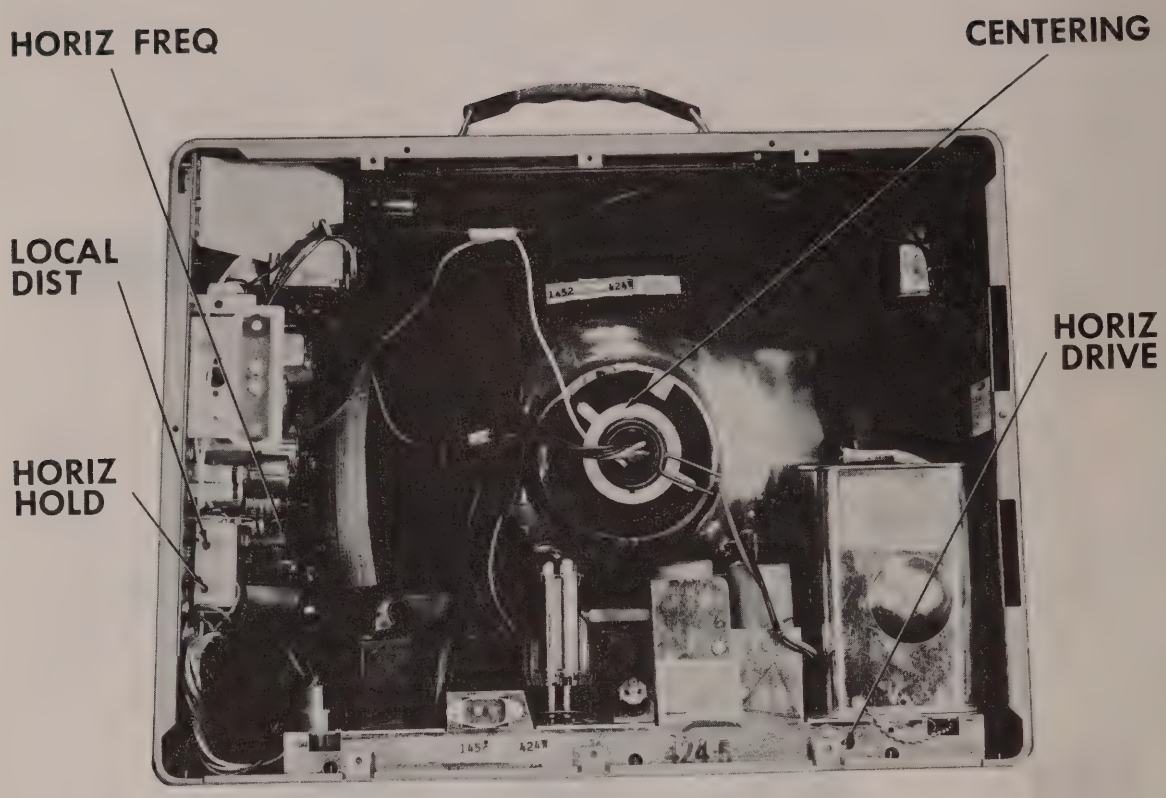
‡ MEASURED FROM PIN 3 OF V12. NC NO CONNECTION.

▲ MEASURED FROM PIN 7 OF V2. TP TIE POINT.

BOTTOM VIEW



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV signal and set the "Local-Distance" fully counterclockwise.

Connect a clip lead across the Horizontal Frequency coil (L17). Connect another clip lead from point Ⓒ to chassis.

Adjust the Horizontal Hold until the picture synchronizes horizontally. (In most cases the picture will appear to float back and forth across the screen.)

Remove the clip lead from L17. Adjust the Horizontal Frequency slug (B1) until the picture again synchronizes horizontally.

Remove the clip lead from point Ⓒ and chassis. The picture should then lock in solid.

Set the Horizontal Drive as far counterclockwise as possible without the presence of a vertical white line (drive line) or compression near the center of the raster.

Insufficient width may be corrected by connecting a jumper across R75.

PHOTOFACT* Folder with CIRCUITRACE*

*TRADE MARK

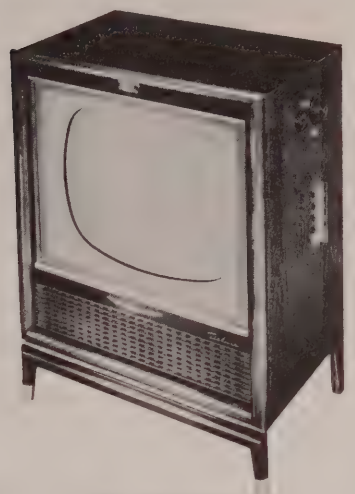
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

RCA VICTOR CHASSIS KCS121A, B, C, D, E, F, H, J, K, L, M, N, P, R

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type knobs from the side.
2. Remove 11 wood screws and 1 metal clip holding the rear cover. Remove the rear cover.
3. Remove picture tube socket, yoke plug, tuner plugs, HV lead and speaker leads.
4. Remove 2 metal screws holding the side control panel bracket.
5. Remove 1 metal screw holding the On-Off-Volume control to mounting bracket.
6. Remove front channel indicator pilot light.
7. Remove 2 bottom chassis bolts and 2 top hex nuts holding chassis to mounting brackets.
8. Remove the chassis from rear of cabinet.



MODEL 21D9475 (Ch. KCS121E)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		21D9195, 21D9197	KCS121A
		21D9195U, 21D9197U	KCS121B
		21T9375, 21T9376, 21T9377, 21T9378	KCS121C
		21T9375U, 21T9376U, 21T9377U, 21T9378U	KCS121D
		21D9475, 21D9477, 21D9516	KCS121E
		21D9475U, 21D9477U, 21D9516U	KCS121F
		21D9495, 21D9496, 21D9497, 21D9530, 21D9534	KCS121H
		21D9495U, 21D9496U, 21D9497U, 21D9530U, 21D9534U	KCS121J
		21RD9675, 21RD9676, 21RD9677	KCS121K
		21RD9675U, 21RD9676U, 21RD9677U	KCS121L
		21RD9690, 21RD9699	KCS121M
		21RD9690U, 21RD9699U	KCS121N
		21D9182, 21D9185, 21D9187	KCS121P
		21D9182U, 21D9185U, 21D9187U	KCS121R
		Remote Control Receiver	KRK83A
		Remote Control Transmitter	KRK84A

MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N.J.
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 220 Watts, 2.08 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector knob. The adjustments are accessible, one at a time, as the Channel Selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Insert small bladed screwdriver under metal trim channel at top and bottom of safety glass. Pry to remove. Slide bars to remove top and bottom retainers. Remove safety glass.

SPECIAL ADJUSTMENTS

A. AGC
Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A7) located on bottom of chassis.

FUSE DEVICE

A thermal switch (M8) is used for LV power supply protection. A 9Ω fusible resistor (R117) is used for Horizontal Sweep Circuit protection and 3 fuse wires for filament protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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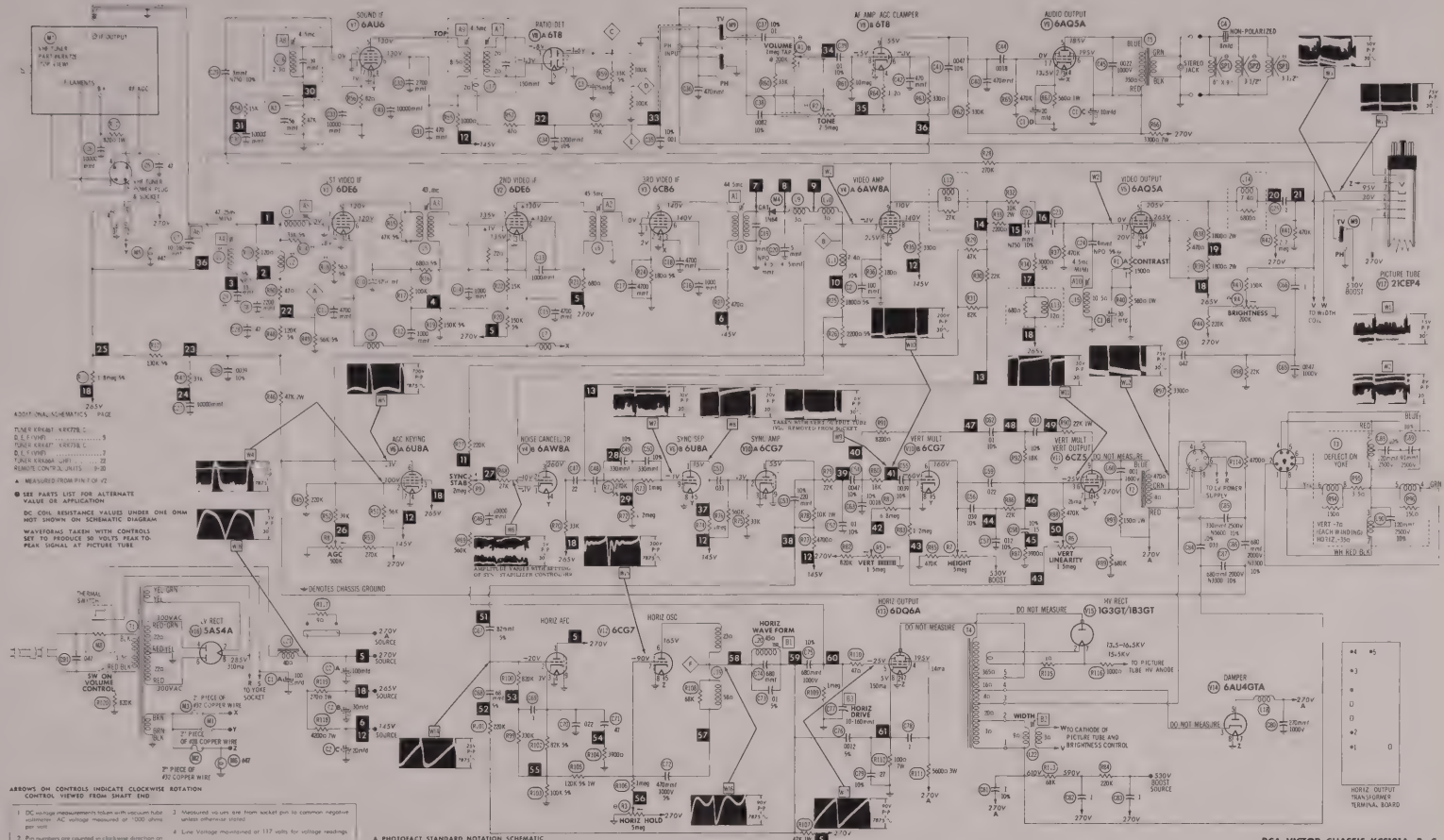
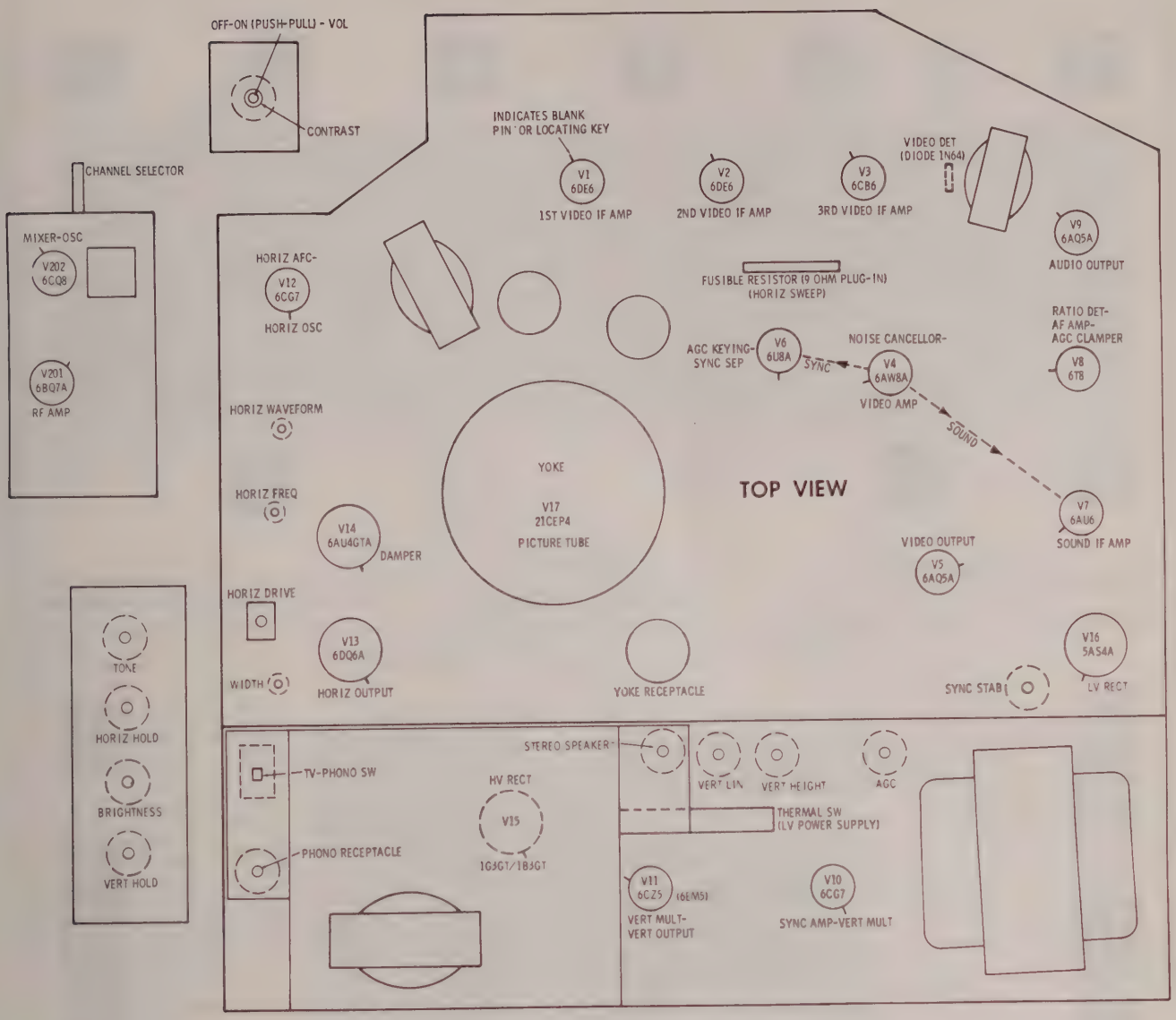
RCA VICTOR CHASSIS KCS121A, B, C, D, E, F, H, J, K, L, M, N, P, R

SET 419 FOLDER 3



RCA VICTOR CHASSIS KCS121A, B, C, D, E, F, H, J, K, L, M, N, P, R

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound — Thermal Switch (M8), Fuse Wire (M1, M2, M3), V16

SWEEP FAILURE
No raster, has sound — V12, Fusible Resistor (R117), V13, V14, V15, V17
No vertical deflection — V10, V11
Poor vert. linearity or foldover — V10, V11
Poor horiz. linearity or foldover — V12, V13, V14
Narrow picture — V12, V13, V14, V16
Vert. off freq. — V10, V11
Horiz. off freq. — V12

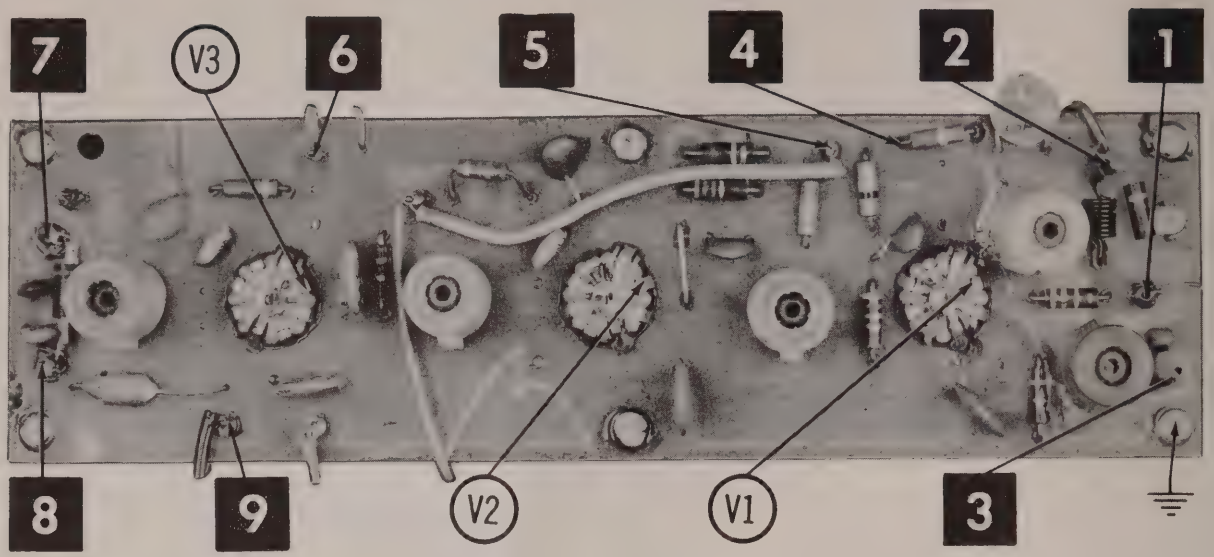
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster — V1, V2, V3, Diode(M4), V4
No pic, no sound, has snow — V201, V202, V1
No pic, has sound, has raster — V4, V5, V17
Has pic, no sound — V7, V8, V9
Overloaded picture — V6

SYNC FAILURE
No vert. sync — V6, V10
No horiz. sync — V6, V10, V12
No vert. or horiz. sync — V6, V10

RCA VICTOR CHASSIS KCS121A, B, C, D, E, F, H, J, K, L, M, N, P, R

FOLDER 3

CircuiTrace Numbers 1 thru 9

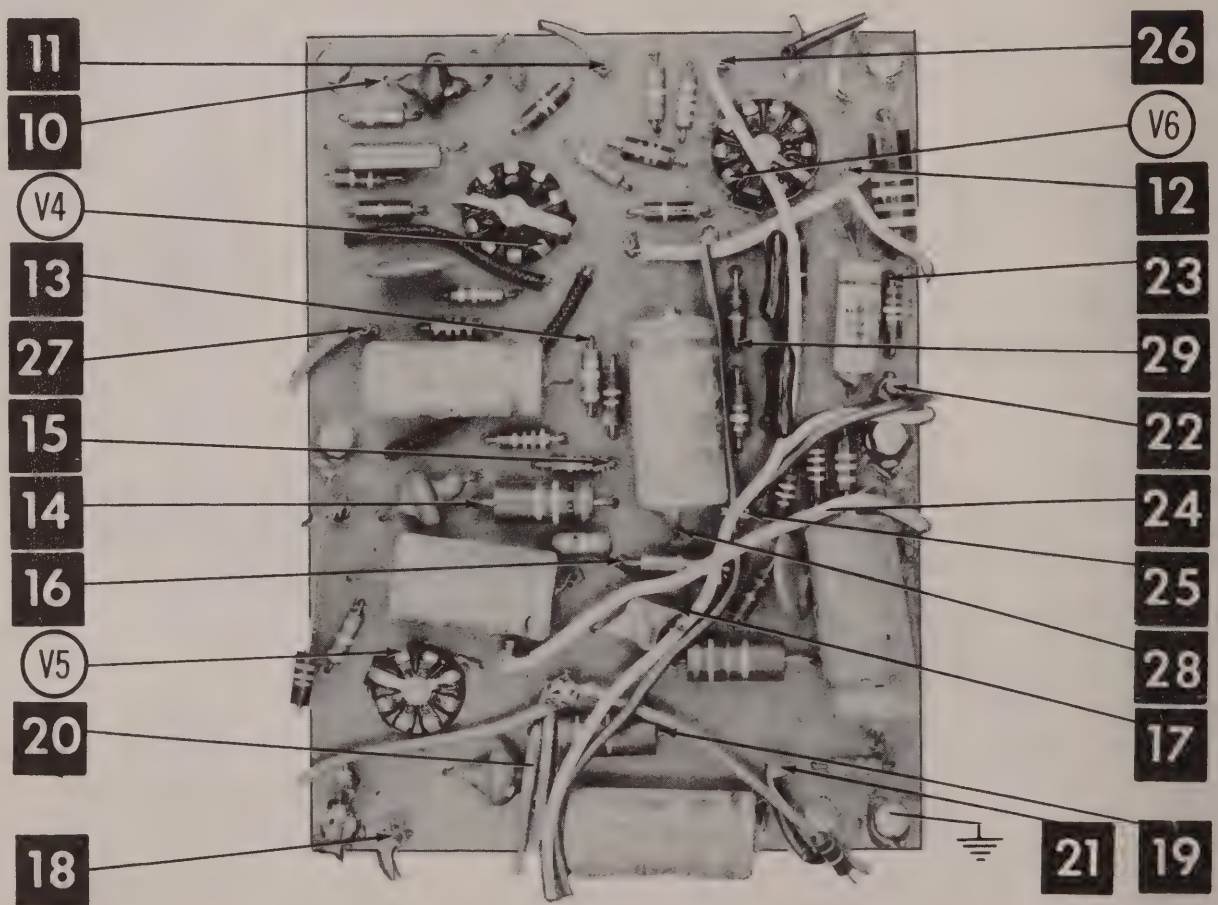


A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

VIDEO IF
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 10 thru 29



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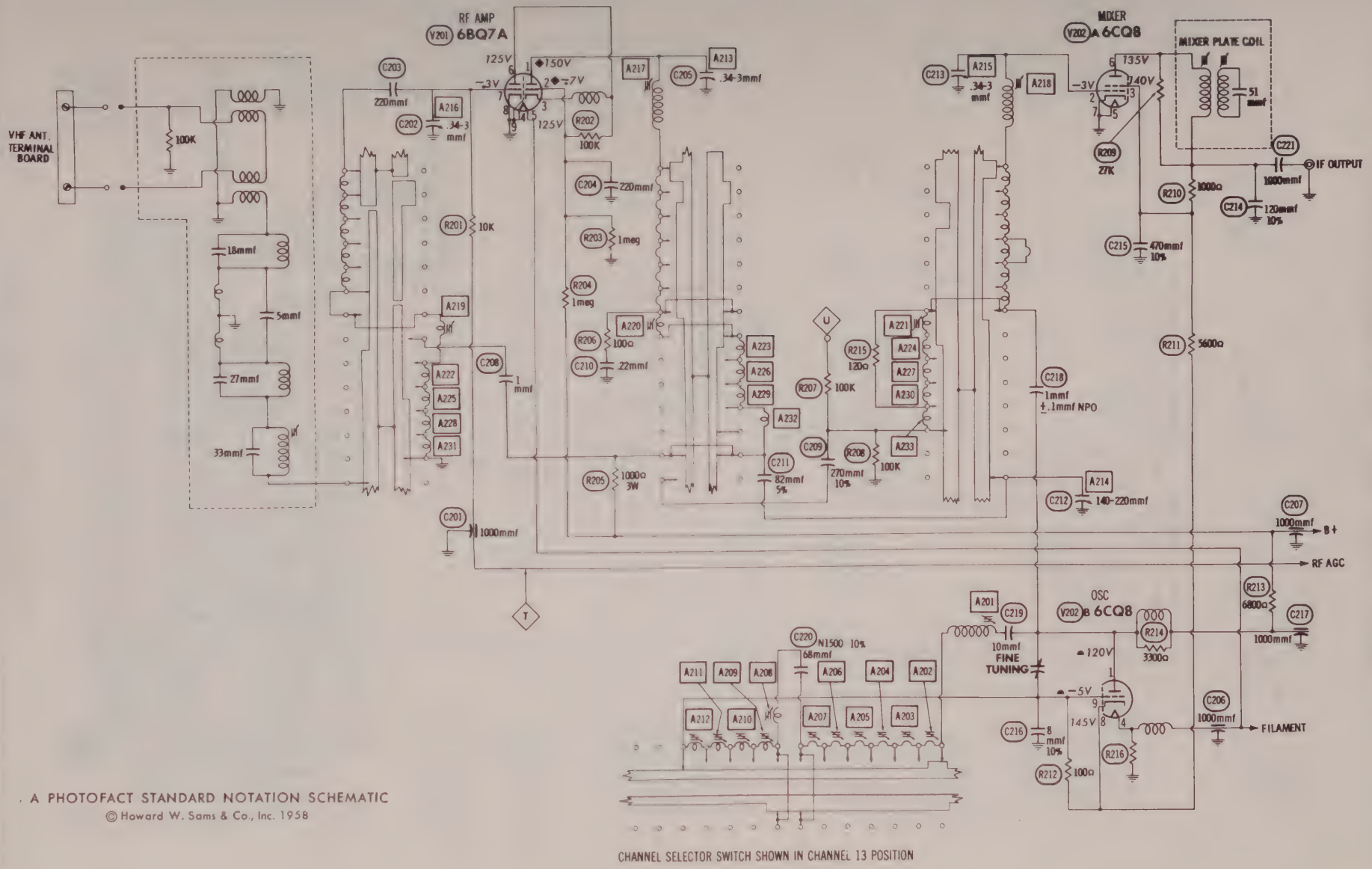
*TRADE MARK

VIDEO SYNC & AGC
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



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CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

VHF TUNER KRK46T, KRK72B, C, D, E, F

TUNER PARTS LIST AND DESCRIPTIONS

KRK 72E

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BQ7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CQ8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	1000		105660	EF-001	MFT-1000			503C-D1	
C202	.34-3		105757						
C203	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C204	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C205	.34-3		105757						
C206	1000		105660	EF-001	MFT-1000			503C-D1	
C207	1000		105660	EF-001	MFT-1000			503C-D1	
C208	1		77690						
C209	270		77838		D6-271	L10T27		MS-327	10%
C210	.22		105857						
C211	82		103560	1469-000082		22R5Q82		MS-482	5%
C212	140-220		103519						
C213	.34-3		105757						
C214	120		106194		D6-121	L10T12		MS-312	10%
C215	470		78622		D6-471	5R5T47		MS-347	10%
C216	8		106043						10%
C217	1000		105660	EF-001	MFT-1000			503C-D1	
C218	1		105781						±.1mmf NPO
C219	10			NPO-SI 10	TCZ-10	CTA6Q1C	ZT-541	5TCC-Q1	1
C220	68		105855						N1500 10%
C221	1000		105660	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	

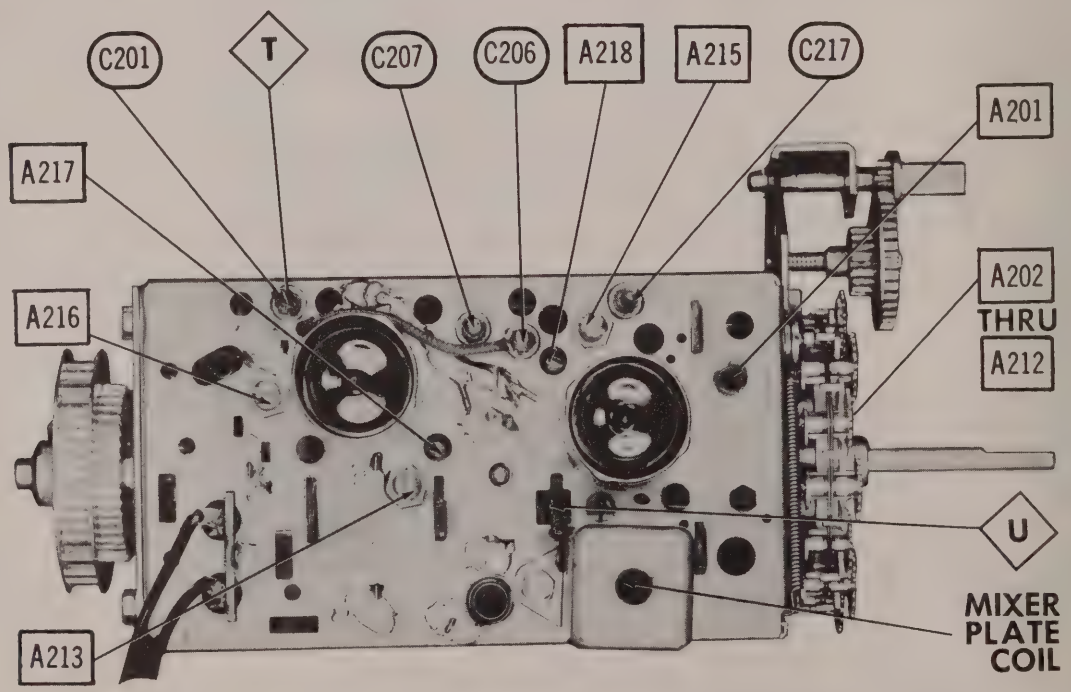
1 Some versions may use 12mmf 5% in this application (Part #106193).

RESISTORS

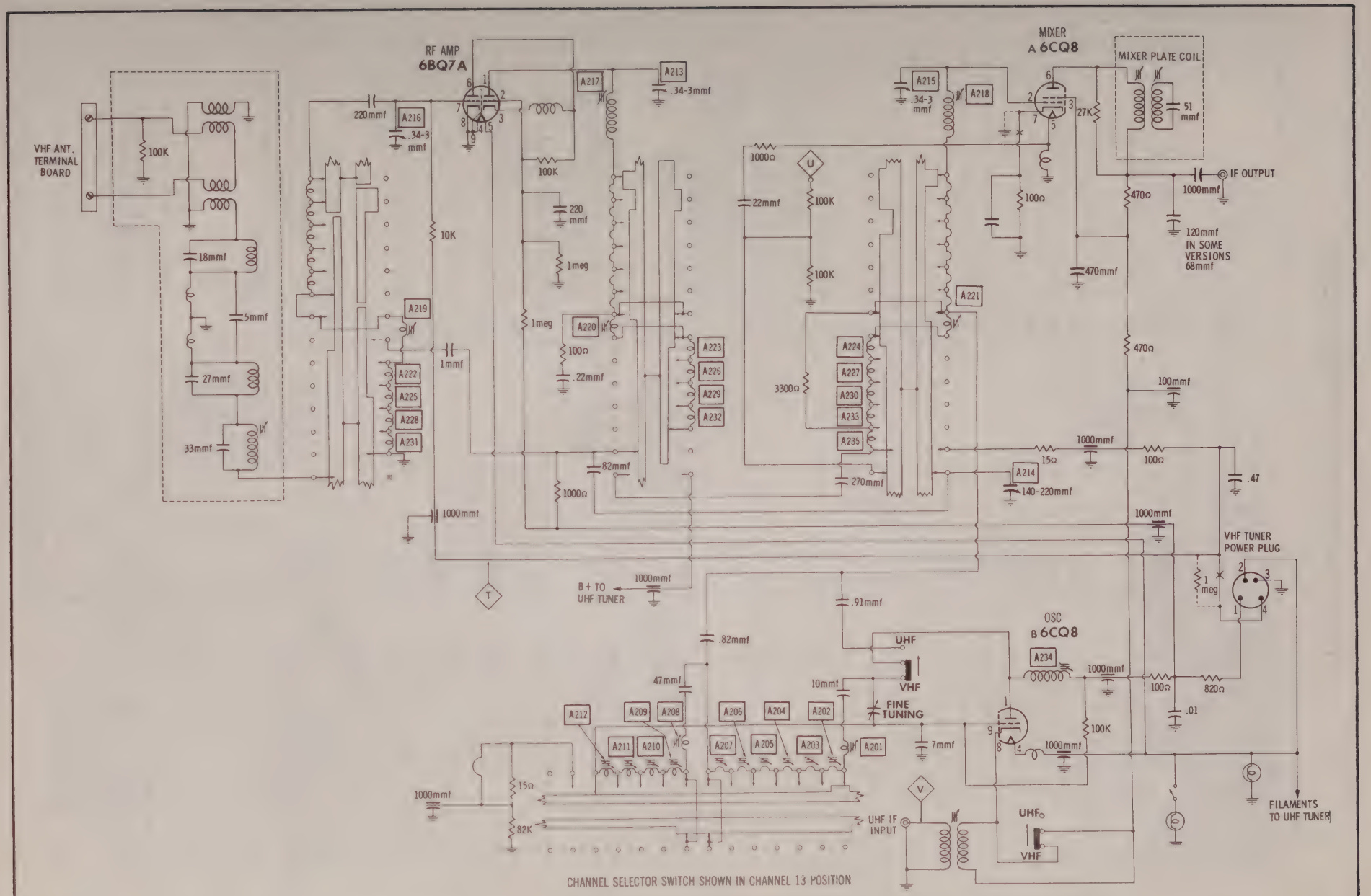
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R201	10K			
R202	100K			
R203	1meg			
R204	1meg			
R205	1000Ω	3	10c042	
R206	100Ω			
R207	100K			
R208	100K			

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R209	27K			
R210	470Ω			
R211	1000Ω			
R212	5600Ω			
R213	100Ω			
R214	6800Ω			
R215	3300Ω			
R216	120Ω			



TUNER KRK72E - TOP VIEW



VHF TUNER WITH UHF PROVISIONS KRK47T, KRK73B, C, D, E, F

RCA VICTOR CHASSIS KCS121A, B, C, D,
E, F, H, J, K, L, M, N, P, R

FOLDER 3

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TUNER ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT

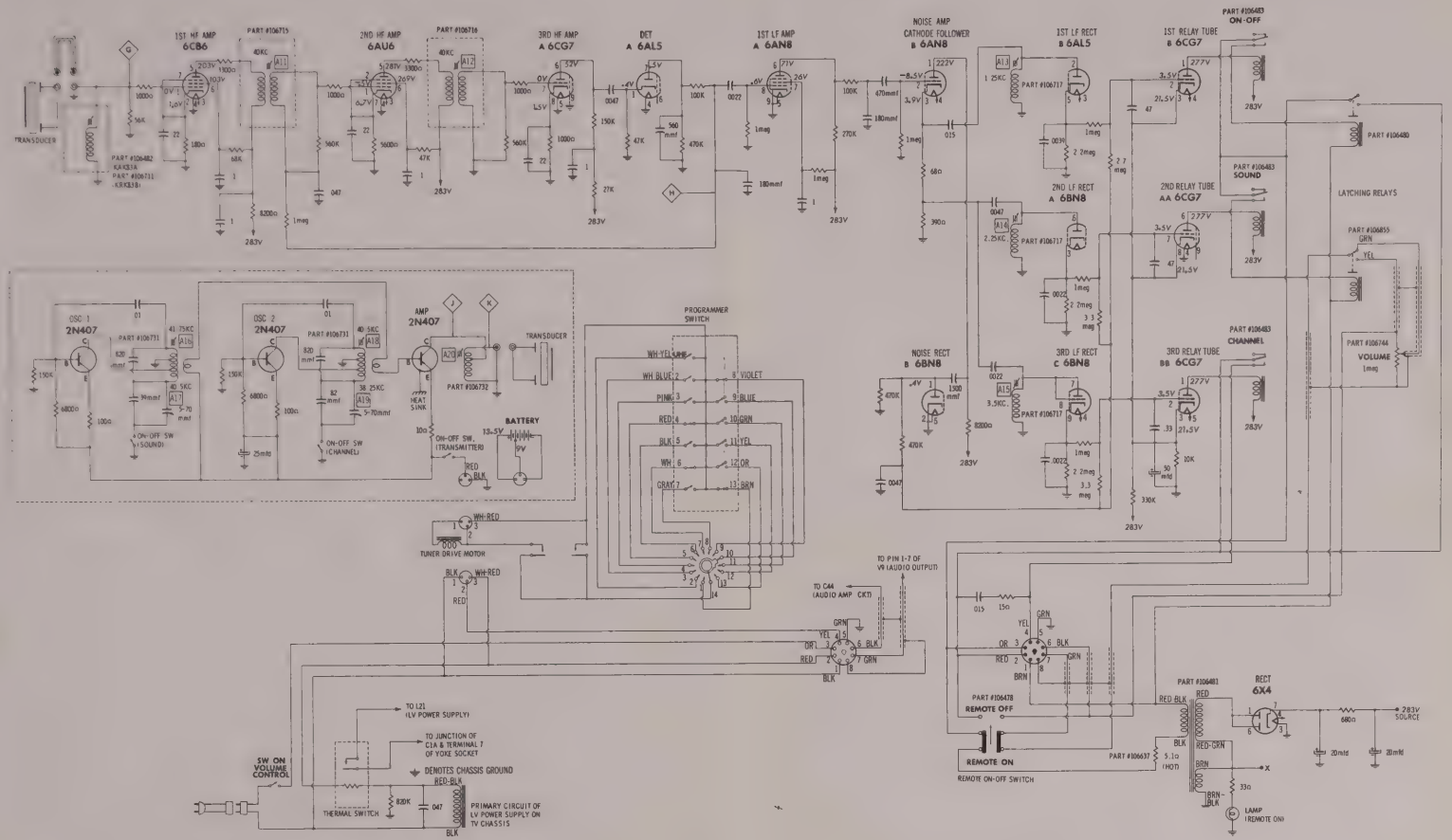
Connect the negative lead of a 3 volt bias supply to point (T). Positive to chassis.
Unplug IF output cable from the tuner and connect a 39Ω resistor across the socket.
Unplug UHF tuner (if used) and plug adaptor (shown in Fig. 203) in its place.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough Sweep Generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru pad (Fig. 201).	Not used	257MC	13	Vert. Amp. thru diode probe to point (U). Low side to chassis.	A201	Adjust for zero beat on scope.
2.	"	"	"	251MC	12	"	A202	"
3.	"	"	"	245MC	11	"	A203	"
4.	"	"	"	239MC	10	"	A204	"
5.	"	"	"	233MC	9	"	A205	"
6.	"	"	"	227MC	8	"	A206	"
7.	"	"	"	221MC	7	"	A207	"
8.	"	"	"	129MC	6	"	A208	"
9.	"	"	"	123MC	5	"	A209	"
10.	"	"	"	113MC	4	"	A210	"
11.	"	"	"	107MC	3	"	A211	"
12.	"	"	"	101MC	2	"	A212	"
13.	"	"	183MC	181.25MC 185.75MC	8	"	A213, A214, A215, A216	Adjust for maximum gain and symmetry of response similar to Fig. 203. with markers as shown. Adjust A213 for marker position, A214 for proper bandwidth, A215 for proper tilt and A216 for maximum gain.
14.	"	"	213MC	211.25MC 215.75MC	13	"	A217, A218	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A217 for proper marker positions, A218 for proper tilt and retouch A214 for proper bandwidth.
15.	Repeat steps 13 and 14 for proper tracking and response on all channels from 13 to 7. Repeat step 1. Turn off generators and measure oscillator injection voltage at point (U) with VTVM. The reading obtained should be between -2.5 to -5.5 volts for VHF only tuner -1.5 to -4.75 for UHF-VHF. If outside these limits, replace V202 and repeat steps 1 thru 14.							
16.	Repeat step 8.							
17.	Fig. 201	Across antenna terminals thru pad (Fig. 201).	85MC	83.25MC 87.75MC	6	Vert. Amp. thru diode probe to point (U). Low side to chassis.	A219, A220, A221	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A219 for maximum gain, A220 for proper marker positions and A221 for proper tilt.
18.	"	"	79MC	77.25MC 81.75MC	5	"	A222, A223, A224	If necessary, adjust appropriate coil for response similar to Fig. 202.
19.	"	"	69MC	67.25MC 71.75MC	4	"	A225, A226, A227	"
20.	"	"	63MC	61.25MC 65.75MC	3	"	A228, A229, A230	"
21.	"	"	57MC	55.25MC 59.75MC	2	"	A231, A232, A233	"

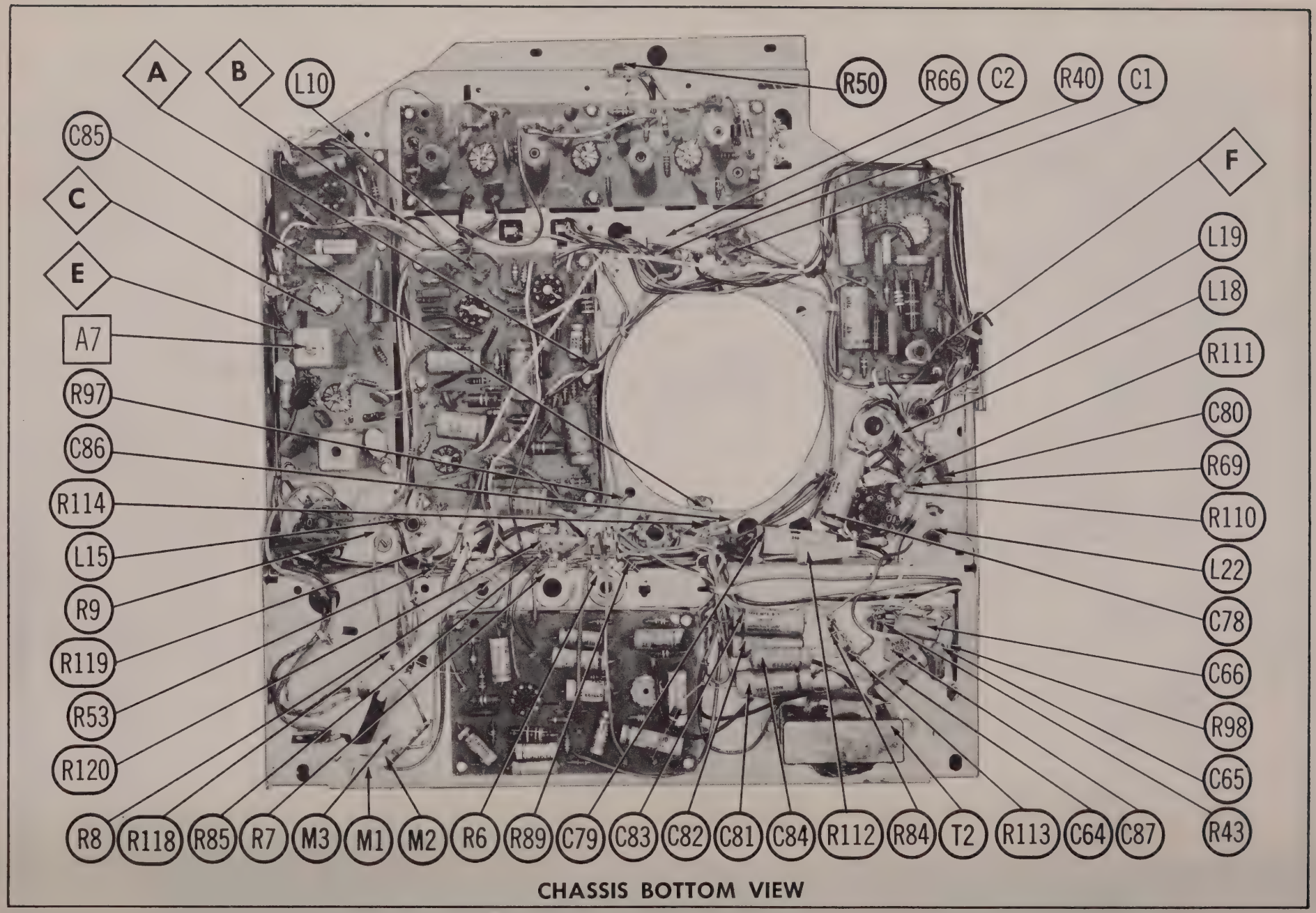
UHF ALIGNMENT FOR UHF-VHF TUNERS

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 203	High side thru adaptor (Fig. 203) to point (V). Low side to chassis.	44MC	41.25MC 45.75MC	UHF	Connect 330mmf capacitor in series with a 180Ω resistor from plate of Mixer (V202) to chassis with resistor next to chassis. High side of scope thru diode probe to junction of capacitor and resistor Low side to chassis.	A234, A235	Use only enough Sweep Generator output to provide a usable pattern on scope. Adjust A234 and A235 for response similar to Fig. 204.
23.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead. Reconnect cable from UHF tuner to VHF tuner. Connect separate marker generator loosely to grid of 1st. Video IF Amp. (V1).	Tune over entire UHF range.	42.5MC 45.0MC 45.75MC	Tune over entire UHF range	Across video detector load.		Use only enough Sweep Generator output to provide a usable pattern on scope. Check tracking across UHF band and if necessary, retouch A234 and A235 for response similar to Fig. 205.

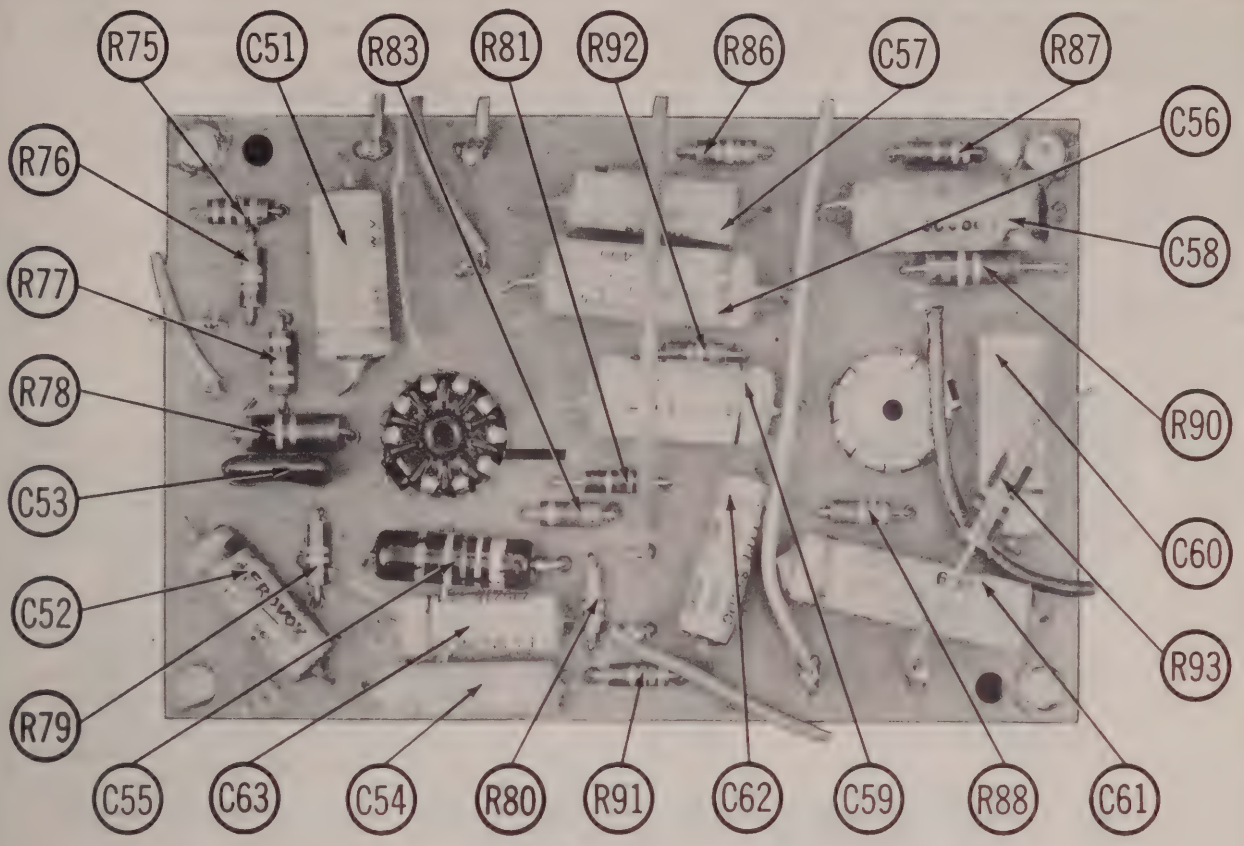
CONTINUED PAGE 21



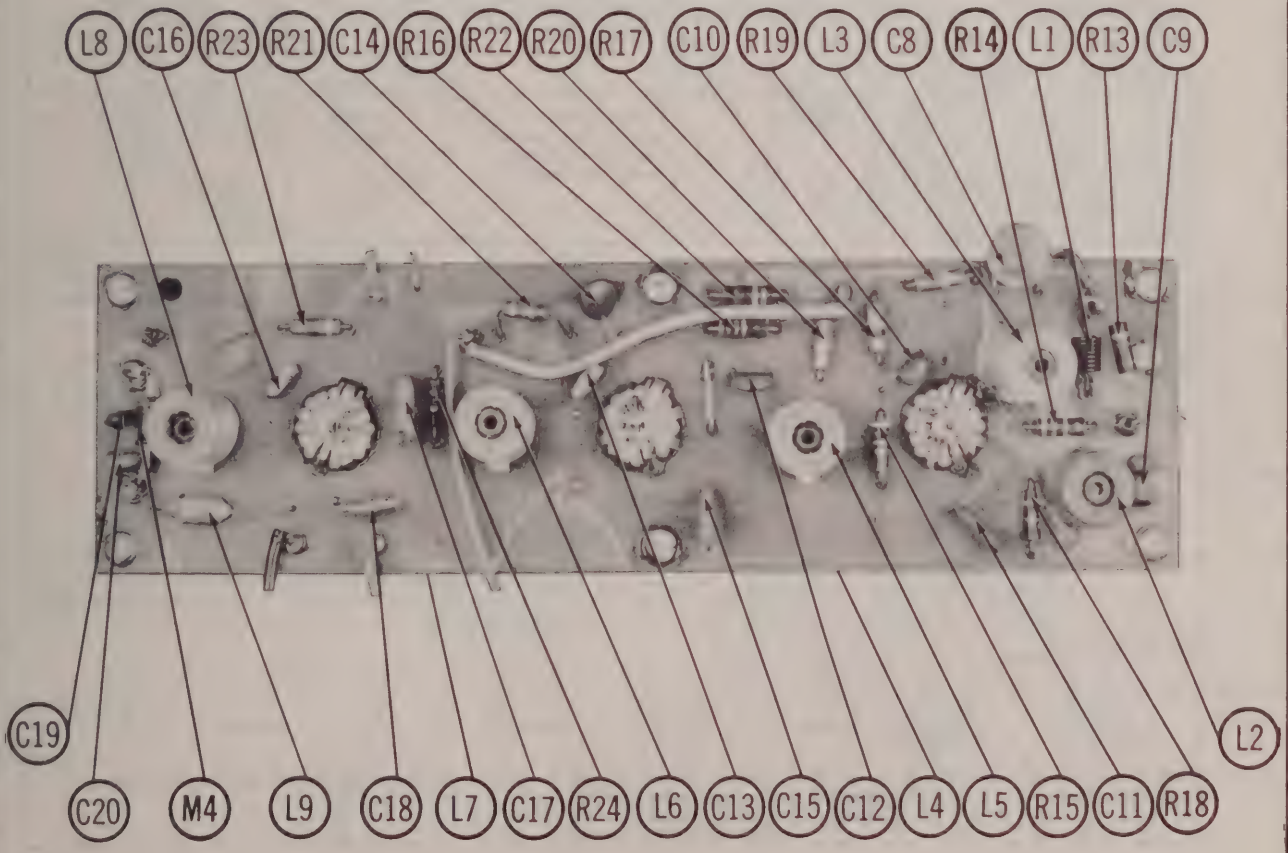
REMOTE RECEIVER CHASSIS KRK83A, REMOTE TRANSMITTER CHASSIS KRK84A



CHASSIS BOTTOM VIEW



SYNC & VERT PRINTED BOARD



VIDEO IF PRINTED BOARD

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Disable the horizontal sweep circuits by connect a 150Ω 10W resistor in series with the plate lead of the Horizontal Output tube (V13).
Connect the negative lead of a 12.5 volt bias supply to pin 5 (grid) of V13. Positive to chassis.
Suggested alignment tools: A1, A2, A3, A4, A5, A7, A8, A9, A10, A11, A12 ..... General Cement #8282, 8606L, 9295
Walsco #2543, 2544, 2545
A6 ..... General Cement #9291
Walsco #2520, 2522

VIDEO IF ALIGNMENT

Connect the negative lead of a 6 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1500mmf	High side to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	44.5MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe to point (B). Common to chassis. (Across video det. load.)	A1	Adjust for maximum deflection. Adjust generator output to maintain 3 volts on VTVM when finally peaked.
2.	"	"	"	45.5MC	"	"	A2	"
3.	"	"	"	43.0MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4 & Mixer Plate Coil (Top)	Increase generator output and adjust for MINIMUM deflection.
5.	"	"	44.0MC (10MC Swp)	42.5MC 45.75MC	"	Vert. Amp. thru detector (Fig. 1) to pin 5 (plate) of 6DE6 (V1). Low side to chassis.	A5, A6 & Mixer Plate Coil (Bottom)	Connect the negative lead of a 3 volt bias supply to point (C). Positive to chassis. Connect a 180Ω resistor from plate to screen (pin 5 to 6) of 6DE6 (V1). Use only enough Sweep Generator output to provide a usable pattern on scope. Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Remove 180Ω resistor.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Remove detector probe. Vert. Amp. thru 10K to point (B). Low side to chassis.	A1, A2, A3	Retouch for response similar to Fig. 3, if necessary.
7.	"	High side thru pad (Fig. 4) to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	45.75MC	"	USE VTVM. DC probe to point (B). Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
8.	"	Remove pad. High side to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	"	41.25MC	"	Connect VTVM & Vert. Amp. of scope thru 10K to point (B). Common to chassis.	A3, A1	Retouch for 1.0 to 1.5 volts on VTVM while maintaining response similar to Fig. 3.
9.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Each VHF channel in turn.	42.5MC 45.0MC 45.75MC	All VHF channels	Vert. Amp. thru 10K to point (B). Low side to chassis.	A1, A2	SLIGHTLY retouch A1 and A2 to correct for any overall tilt that is approximately the same on all channels. Restore horizontal circuit to normal.

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point (A). Positive to chassis.
Connect two matched 100K (±1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (C). Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (E). Common to point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Set the Contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector probe to pin 2 (grid) of picture tube. Low side to chassis.	A10	Adjust for MINIMUM 400∿ indication on scope.

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CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st. V.I.Ampl. Amp	6DF6	
V2	2nd. Video IF Amp	6DF6	
V3	3rd. Video IF Amp	6CB6	
V4	Video Amp. - Sync. Separator	6AW8A	
V5	Video Output	6AQ8A	
V6	Asc. Sync. Sep. & Asc. Sync. Amp.	6L8A	
V7	Sound IF Amp	6AU6	
V8	Ratio Det., A.F. Amp. - A.G.C. Clamper	6T8	

ITEM No	USE	TYPE	NOTES
V9	Audio Output	6AQ8A	
V10	Sync Amp. - Vert. Mult.	6CQT	
V11	Vert. Mult. - Vert. Output	6CB6	
V12	Horiz. AFC-Horiz. Osc.	6CQT	
V13	Horiz. Output	6DQ6A	
V14	Damper	6AV4GTA	
V15	H.V. Rect.	1G3GT .03GT	
V16	L.V. Rect.	5AS4A	

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V17	21CEP4		21CEP4 1	21CEP4 2	1 Silverania D 2 Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	400	100853	AFH54-57-40	D0875	FP430.Y	TMT-186 TD-30-150	Q-342	TVL-4663, 5
B	30	50							
C	40	400						Q-036 MT-4830	R3532 *
D	20	50							
C2A	200	400	104301	AFH4-05-40	C0365 BRB3045	FP339.86			
B	40	400							
C	20	400							
C3	30	50	78943	PRS80V3	BBR5-50	TT50X5	TD-5-50	MT-0504	TVA-1303
C4	5	10NP	102847	AC-PRS10V8	BBR10-90 † BBR16-90 †	TC308	TD-10-150 TD-15-150	MT-1515 MT-1518	R3534 *

* Not normally in distributors stock. Available thru distributor on order manufacturer.
† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	.47	200	78148A	PSS8N-47		CUD2P47	GEM-3047	2TM-P47	
C6	10000		73990	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C7	12-150		100849						
C8	2200		104899	BPD-0022	DD-222	BYA10D22	B-222	6HK-D22	
C9	18		103866	NPO-01 S	TCZ-18	CTA8Q18C	CNO-418		NPO 5% ①
C10	470		78632	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C11	4700		73473	BPD-047			B-347	5HK-D47	
C12	1000		77252	BPD-001		BYA8D1	B-210	5HK-D1	
C13	1000		102334A	BPD-001	DD-102	BYA8D1	B-210	5HK-D1	
C14	1000		77252	BPD-001		BYA8D1	B-210	5HK-D1	
C15	4700		73473	BPD-0047			B-347	5HK-D47	
C16	3300		102334A	BPD-002		BYA6D1	B-206	5HK-D1	
C17	4700		73473	BPD-0047			B-347	5HK-D47	
C18	4700		73473	BPD-0047			B-247	5HK-D47	
C19	7		104177						NPO s. 5mmf
C20	6		104178	NPO-S2 S		C30Y5C			
C21	100		103900	1469-001	DD-101	32R5T1	MCB-235	M8-31	10%
C22	39		103894	NTS0-S1 39	TCN-39	CTA8Q39U	CNT-439		NTS0 10%
C23	.1	600	106333	PS88N-1	DF-104	CUD8P1	GEM-601	6TM-P1	
C24	8		104898						NPO 5%
C25	.1	600	106333	PS88N-1	DF-104	CUD8P1	GEM-601	6TM-P1	
C26	.0039	400	106313					6SF-D39	10%
C27	10000		73990	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C28	.47	200	78148A	PS88N-47		CUD2P47	GEM-3047	2TM-P47	
C29	3		103915						NTS0 10%
C30	10000		73990	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	470		73466	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C32	2700		104531						10%
C33	10000		73990	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	1200		104394				JL-312		10%
C35	001	400	103898A				GEM-1521	5BY-D10	10%
C36	470		108546	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C37	.01	600	106335				GEM-1511	5BY-S10	10%
C38	.0082	300	103517A				GEM-16353	5BY-D82	10%
C39	.01	300	101000A				GEM-1611	5WF-S10	10%
C40	470		73466	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C41	.0047	600	73920				GEM-16347	5BY-D47	10%
C42	470		77252	BPD-00047		L10T47	B-347		
C43	10000		73990	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C44	.0018	100	102217A					5BY-D18	10%
C45	.0033	1000	73803					5BY-D33	10%
C46	10000		73990	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C47	.22	300	104310	PS88N-22		CUD2P22	GEM-2022	2TM-P22	
C48	.1	600	105215	PS88N-1	DF-104	CUD8P1	GEM-601	6TM-P1	
C49	330		102856	1469-00033	MD-331	5R5T33		M8-333	10%
C50	330		102856	1469-00033	MD-331	5R5T33		M8-333	10%
C51	033	400	105318	PS88N-033		CUD8S33	GEM-4133	6SF-S33	10%
C52	.01	600	106185				GEM-1611	5BY-S10	10%
C53	220		102144	1469-00022	MD-221	5R5T22		M8-223	10%
C54	.0047	600	105325A				GEM-16347	5BY-D47	10%
C55	.0039	600	78221					5BY-D39	10%
C56	010	600	73780					5BY-S10	10%
C57	012	600	73781					5BY-S12	10%
C58	15	300	104648				GEM-3015	5BY-P15	10%
C59	022	600	104245	PS88N-022		CUD8S22	GEM-6122	6TM-S22	
C60	001	1900	73949		DD30-102	CUD18S1	GEM-1621	M8-D1	
C61	.047	600	104245					5BY-S47	10%
C62	.01	300	78916				GEM-1611	5WF-S10	10%
C63	0015	600	107427					5BY-D15	10%
C64	.047	400	73553	PS88N-047	DF-103	CUD4S47	GEM-4147	4TM-S47	
C65	.0047	1000	73806	PD88N-0047	DS-472	CUB10D47	GEM-10347	10TM-D47	
C66	.1	600	73551	PS88N-1	DF-104	CUD4P1	GEM-601	4TM-P1	
C67	82	1000	78474						5%
C68	68	1000	78475						5%
C69	.1	600	73551	PS88N-1	DF-104	CUD4P1	GEM-601	4TM-P1	
C70	.022	600	103351A	PS88N-022		CUD4S22	GEM-4122	4TM-S22	
C71	.47	600	78148A	PS88N-47		CUD4P47	GEM-4047	4TM-P47	
C72	470	1000	104147						5%
C73	91	600	73594						5%

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C74	680		106318	BPD-00068	DD-681	L10T68	B-368	5GA-T68	
C75	680	1000	78796		MD-681			M8-368	10%
C76	.0013	600	76898						5%
C77	10-160		100849						
C78	.1	600	78917	PS88N-1	DF-104	CUD8P1	GEM-601	6TM-P1	
C79	.27	200	73786					5WF-P27	10%
C80	270	1000	78179						10%
C81	.01	600	73551						10%
C82	.1	400	73551	P4S8N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C83	.1	600	73551	PS88N-1	DF-104	CUD4P1	GEM-601	4TM-P1	
C84	.03	400	73552					6SF-S33	
C85	330	2500	106803						10%
C86	680	3000	106803						N3300 10%
C87	680	3000	106803						N3300 10%
C88	130	2500	103538						10%
C89	91	2500	103535						10%
C90	130	2500	103536						10%
C91	.047	600	73592	PS88N-047		CUD8S47	GEM-8147	6TM-S47	

① Chassis KCS121H, J use 12mmf 5% in this application (Part #106320).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.		
R1A	1500Ω	½	106435				UK162S		Contrast, Note 1
B	1meg						Not Req.		Volume, Tap @ 200K, Note 1
C	Switch						Not Req.		
R2A	2.5meg	½	104103	B-53	A47-3.5meg -S	QU-239	U266		Tone, Note 2
B	Shaft			Not Req.	FB-3	Not Req.	Not Req.		
R3	5meg	½	106440						Horiz. Hold, Note 3
R4A	200K	½	104088	B-46	A47-200K-S	QU-139	U43		Brightness, Note 4
B	Shaft			Not Req.	FB-3	Not Req.	Not Req.		
R5A	1.5meg	½	104089	B-743	A47-1.5meg -S	QU-138	U186		Vert. Hold, Note 5
B	Shaft			Not Req.	FB-3	Not Req.	Not Req.		
R6A	1.5meg	½	103408		B47-1.5meg -S	BU-138	TA185L		Vert. Lin.
B	Shaft			Not Req.		Not Req.	Not Req.		
R7A	5meg	½	100290		B47-5meg-S	BU-141	PTA58L		Height
B	Shaft			Not Req.		Not Req.	Not Req.		
R8A	500K	½	100863			BU-139	PTA56R		AGC
B	Shaft					Not Req.	Not Req.		
R9A	2meg	½	100863	AB-75	B47-2meg-S	BU-139	TA38L		Sync Stab.
B	Shaft			AE-1	Not Req.		Not Req.		

Note 1. Part #106436 used in Ch. KCS121P, R.
Note 2. Part #106439 used in Ch. KCS121A, B.
Note 3. Part #106441 used in Ch. KCS121A, B.
Note 4. Part #106437 used in Ch. KCS121A, B.
Note 5. Part #106439 used in Ch. KCS121A, B.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R10	120K 5%		502413	
R11	1.8meg 5%		502518	
R12	620Ω	1	502182	
R13	120Ω		502113	
R14	33K 5%		502333	Note 1
R15	47K 5%		502347	Note 2
R16	6800 5%		502268	
R17	100K		502410	
R18	560 5%		502056	Note 3
R19	150K 5%		502415	
R20	150K 5%		502415	
R21	680Ω		502169	
R22	15K		502315	
R23	470Ω		502147	
R24	180Ω 5%		502118	
R25	1800Ω 5%		502218	
R26	2300Ω 5%		502222	
R27	220K		502422	
R28	270K		502427	
R29	47K		502347	
R30	33K		502333	
R31	53K		502352	
R32	10K	2	502310	
R33	2200Ω		502222	
R34	3000Ω 5%		502230	
R35	330Ω		502133	
R36	1800Ω		502318	
R37	470K		502447	
R38	1800Ω	2	502218	
R39	1800Ω	2	502218	
R40	560Ω	1	512156	
R41	470K		502447	
R42	2.7meg		502527	
R43	150K		502415	
R44	220K		502422	
R45	220K	2	502422	
R46	47K	2	502347	
R47	33K		502333	
R48	120K 5%		502412	
R49	56K 5%		502356	
R50	47Ω		502047	
R51	56K		502356	
R52	39K		502339	
R53	270K		502427	
R54	15K		502315	
R55	1000Ω		502310	
R56	82Ω		502082	
R57	47Ω		502047	
R58	39K		502339	
R59	33K 5%		502333	
R60	33K		502333	
R61	10meg		502610	
R62	330K		502433	
R63	330Ω		502133	
R64	1.2Ω		72787	
R65	470K		502447	

Note 1. Ch. KCS121E, J use 47K in this application (Part #502347).
Note 3. Some versions may use 82Ω in this application (Part #502082).

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R66	3300Ω	7	102417	
R67	580Ω	1	502156	
R68	27K		502327	
R69	560K		502456	
R70	33K		502333	
R71	370K 5%		502437	
R72	1.2meg		502512	
R73	1meg		502510	
R74	1meg		502510	
R75	33K		502333	
R76	560K		502456	
R77	470Ω		502447	
R78	10K	1	512310	
R79	22K		502322	
R80	18K		502318	
R81	6.8meg		502568	
R82	330K		502453	
R83	1.2meg		502512	
R84	330K		502433	
R85	470K		502447	
R86	22K		502322	
R87	3900Ω		502239	
R88	470K		502447	
R89	680K		502468	
R90	22K	1	512322	
R91	8200Ω		502282	
R92	18K		502318	
R93	150Ω	1	512115	
R94	150Ω		502215	
R95	2.5Ω			
R96	150Ω			
R97	3300Ω		502333	
R98	22K		502322	
R99	330K		502433	
R100	330K		502482	
R101	220K		502422	
R102	82K 5%		502382	
R103	100K 5%		502410	
R104	3900Ω		502239	
R105	180K 5%	1	512412	
R106	1meg		502610	
R107	47K	1	512347	
R108	68K		502368	
R109	1meg		502510	
R110	47Ω		502047	
R111	5600Ω	3	104180	
R112	100Ω	7	104188	
R113	68K		502368	
R114	4700Ω		502247	
R115	1Ω		104352	
R116	1000Ω		502210	
R117	9Ω		104395	
R118	4300Ω	†	102845	
R119	270Ω	1	512127	
R120	620K		502462	

Note 2. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	
L1	RF Choke						①
L2	47.25MC Trap	104241					②
L3	1st. Video IF	104140					
L4	71. Choke						
L5	2nd. Video IF	104139					
L6	3rd. Video IF	104139					
L7	71. Choke						
L8	4th. Video IF	104139					
L9	RF Choke	102819					18 Microhenries
L10	RF Choke	102819					18 Microhenries
L11	Series Peaking Coil	102196	19-3125	TV-195	6153	VP-4	120 Microhenries
L12	Series Peaking Coil	103696	19-3180 *	TV-194 *	6180 *	VP-5 *	180 Microhenries, wound on 2TK resistor
L13	Shunt Peaking Coil	101389	19-3300 ▲	TV-199 ▲	6186 ▲		300 Microhenries, wound on 6800 resistor
L14	Series Peaking Coil	102698	19-3126 †	TV-196 †	6133 †	VP-4 †	120 Microhenries, wound on 8000Ω resistor
L15	4.5MC Trap	106434					
L16	1st. Sound IF	103645					
L17	Ratio Detector	102844					Tertiary .3Ω
L18	RF Choke	78640	19-1001	BC-883	4804		1.5 Microhenries ②

* Parallel with 2TK resistor.
▲ Parallel with 680Ω resistor.
① Alternate part used in Ch. KCS121E, J.
② Alternate Part #106329 used in Ch. KCS121H, J.
③ IRC Part #CL-1.
† Parallel with 8000Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					NOTES
	PRI.	SEC.	RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L19	8Ω		104087						Tapped @ 23Ω
L20	45Ω		100300						Horiz. Freq. Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(~)	RCA Victor PART No	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.
L21	310A	40Ω	1.2 Hy.	77076	C5027 ①	C-2996 ①		C-2326 ②	28C44 ②	C-23X

① Drill new mounting hole.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		RCA Victor PART No	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Rogers PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.
L22	Width Coil	106838								
A	(1.7-12Mh)									
B	(1.08-1.2Mh)									

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
				RCA Victor PART No	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1	SEC. 2							
T1	117V	370VCT	5V	106532						
	2.08A	310A	3A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3V									
	9.2A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	104101			V31A					A-115X
T3	Yoke-Horiz. (18.63MC)	104408 ①	DF-813 ②		Y-111 ②		DY-36A ②	Y-47 ②	Y-80-2 ②	
	(30°)-Vert. (21.8MS)									
	Rear Cover &									
	Centering Device	104460								
	Yoke Clamp	104409								
T4	Horiz. Output	105533								

① Includes R94, R95, R96, C88, C89 and C90. ② Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.	
T5	7600Ω	3-4Ω	100037	Z1003	A-3020	AU-604	A-3849	26S48	S-9Z	

SPEAKER

	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP	RCA Victor PART No.	QUAM PART No.	
SP1	5" x 8"	PM	3-4Ω	101181 ①	69A3	① Used in Models 21D5475, 7 & U, 9495, 5, 7 & U,
SP2	3½"	PM	9Ω	102819	3A1ST29 ②	9515, U, R73575, 5, 7, 8 & U
SP3	3½"	PM	9Ω	102819	3A1ST29 ②	② Parallel and phase.
	8"	PM	3-4Ω	74564 ③	9A2	③ Used in Models 21D9530, 4 & U
	5"	PM	3-4Ω	104681	5A07R	④ Used in Models 21D9195, 7 & U
	4" x 6"	PM	3-4Ω	104846 ④	46A15	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
R1	Sound IF Grid Filter	56mmf, 47K	104329	Centralab RC-421

RCA VICTOR CHASSIS KCS121A, B, C, D, E, F, H, J, K, L, M, N, P, R

FOLDER 3

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	#28 AWG Copper Wire 2" Length							
M2	#32 AWG Copper Wire 2" Length							
M3	#32 AWG Copper Wire 2" Length							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RCA Victor PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N64	105517	1N64	1N295	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Lamp	102581	#47
M6	Lamp	102581	#47
M7	Tuner	KRK72E	VHF Ch. KCS121E
	Tuner	KRK72B	VHF Ch. KCS121C
	Tuner	KRK72C	VHF Ch. KCS121H
	Tuner	KRK72D	VHF Ch. KCS121A
	Tuner	KRK72F	VHF Ch. KCS121K, M
	Tuner	KRK46T	VHF Ch. KCS121P
	Tuner	KRK47T	VHF With UHF Provisions Ch. KCS121R
	Tuner	KRK73B	VHF With UHF Provisions Ch. KCS121D
	Tuner	KRK73C	VHF With UHF Provisions Ch. KCS121J
	Tuner	KRK73D	VHF With UHF Provisions Ch. KCS121B
	Tuner	KRK73E	VHF With UHF Provisions Ch. KCS121F
	Tuner	KRK73F	VHF With UHF Provisions Ch. KCS121L, N
	Tuner	KRK66A	UHF Ch. KCS121B, D, F, J, R, L, N
M8	Thermal Switch	106542	
M9	Phono Switch	102686	
	Printed Board	106428	Video IF (Less Tubes) Ch. KCS121A, B, C, D, E, F, H, J, P, R
	Printed Board	106429	Video IF (Less Tubes) Ch. KCS121K, L
	Printed Board	102586	AGC & Sync (Less Tubes)
	Printed Board	104314	Sound IF (Less Tubes) Ch. KCS121A, B, C, D, E, F, H, J, P, R
	Printed Board	106739	Sound IF (Less Tubes) Ch. KCS121K, L
	Printed Board	104312	Vert.
	Printed Board	104313	Horiz. Osc.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	106529	Fine Tuning, Models 21D9475, U, 9495, U, 21T9375, U
Knob	106530	Fine Tuning, Models 21D9477, U, 9496, U, 9497, U, 9516, U, 21T9376, U, 9377, U
Knob	106531	Fine Tuning, Models 21D9534, U, 21T9378, U
Knob	104397	Fine Tuning, Models 21D9185, U
Knob	104398	Fine Tuning, Models 21D9187, U
Knob	104401	Fine Tuning, Models 21D9182, U
Knob	106526	VHF Channel Selector, Models 21D9475, U, 9495, U
Knob	106527	VHF Channel Selector, Models 21D9477, U, 9496, U, 9497, U, 9516, U
Knob	106528	VHF Channel Selector, Models 21D9534, U
Knob	106095	VHF Channel Selector, Models 21D9185, 21T9375
Knob	106096	VHF Channel Selector, Models 21D9187, 21T9376, 9377
Knob	106097	VHF Channel Selector, Model 21D9182
Knob	106285	VHF Channel Selector, Model 21T9378
Knob	102653	UHF Channel Selector, Models 21D9185U, 9475U, 9495U, 21T9375U
Knob	102578	UHF Channel Selector, Models 21D9187U, 9477U, 9496U, 9497U, 9516U
Knob	102749	UHF Channel Selector, Models 21D9534U, 21T9378U
Knob	102580	UHF Channel Selector, Model 21D9182U
Knob	106098	VHF-UHF Channel Selector, Models 21D9185U, 21T9375U
Knob	106099	VHF-UHF Channel Selector, Models 21D9187U, 21T9376U, 9377U
Knob	106101	VHF-UHF Channel Selector, Model 21D9182U
Knob	106286	VHF-UHF Channel Selector, Model 21T9378U
Knob	106102	UHF Dial, Models 21D9185U, 9475U, 9495U, 21T9375U
Knob	106103	UHF Dial, Models 21D9187U, 9477U, 9496U, 9497U, 9516U, 9534U, 21T9376U, 9377U, 9378U
Knob	102581	Horiz. Hold, Vert. Hold, Brightness or Tone
Knob	106090	Contrast, Models 21D9185, U, 9475, U, 9495, U, 21T9375, U
Knob	106091	Contrast, Models 21D9187, U, 9477, U, 9496, U, 9497, U, 21T9376, 9377, U
Knob	106283	Contrast, Models 21D9534, U, 21T9378, U
Knob	106092	Contrast, Models 21D9182, U
Knob	106093	Volume, Models 21D9185, U, 9475, U, 9495, U, 21T9375, U
Knob	106100	Volume, Models 21D9187, U, 9477, U, 9496, 9497, U, 9516, U, 21T9376, 9377, U
Knob	106284	Volume, Models 21D9534, U
Knob	106094	Volume, Models 21D9182, U
Dial	104584	VHF Channel Indicator Drum, Models 21D9475U, 9477U, 9516U
Dial	104585	VHF-UHF Channel Indicator Drum, Models 21D9475U, 9477U, 9516U
Dial	104416	VHF Channel Indicator Drum, Models 21D9495, 9496, 9497, 9534
Dial	104417	VHF-UHF Channel Indicator Drum, Models 21D9495U, 9496U, 9497U, 9534U

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

ALIGNMENT INSTRUCTIONS (cont)

REMOTE CONTROL RECEIVER ALIGNMENT

A transmitter which has been checked for frequency accuracy may be substituted for the Signal Generator.
Preset A11 and A12 so that the cores are at approximately the center of the coils.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	1500mmf Ceramic Capacitor	High side to point (G). Low side to chassis.	40.5KC (Unmod)		DC probe to point (B). Common to chassis.	A11, A12	Adjust for maximum deflection. Use only enough generator output to provide a usable indication on VTVM.
14.	"	"	1.25KC		DC probe to pin 5 (cathode) of 6AL5 (1st. LF Rect.). Common to chassis.	A13	"
15.	"	"	2.25KC		DC probe to pin 3 (cathode) of 6BN8 (2nd. LF Rect.). Common to chassis.	A14	"
16.	"	"	3.5KC		DC probe to pin 9 (cathode) of 6BN8 (3rd. LF Rect.). Common to chassis.	A15	"

REMOTE CONTROL TRANSMITTER ALIGNMENT

A separate transmitter which has been checked for frequency accuracy may be substituted for the Signal Generator.
Remove the 40.5KC Oscillator transistor.
The bottom shield and front bezel must be in place during alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	1500mmf Ceramic Capacitor	High side to Vert. Amp. of scope. Low side to scope.	41.75KC (Unmod) (Depress "On-Off" button)		Vert. Amp. thru 10mmf to point (J). Low side to chassis.	A16	Adjust for zero beat on scope.
18.	"	"	40.5KC (Depress "Sound" button)		"	A17	Adjust for zero beat on scope. Replace the 40.5KC transistor in transmitter. Remove 41.75KC Oscillator transistor.
19.	"	"	40.5KC (Depress "On-Off" button)		"	A18	Adjust for zero beat on scope.
20.	"	"	38.25KC (Depress "Sound" button"		"	A19	Adjust for zero beat on scope. Replace 41.75KC transistor.
21.		Disconnect signal generator.	Depress "Channel" button		Vert. Amp. thru 10mmf to point (K). Low side to chassis.	A20	Adjust for maximum amplitude consistent with maximum modulation percentage. (See Fig. 5).

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 8 & 21

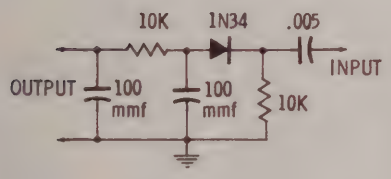


FIG. 1

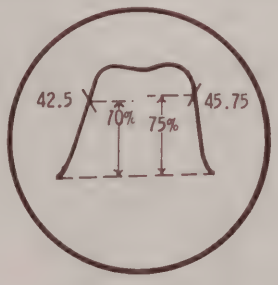


FIG. 2

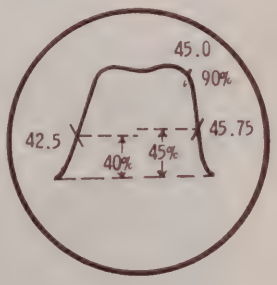


FIG. 3

FIG. 4

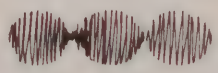
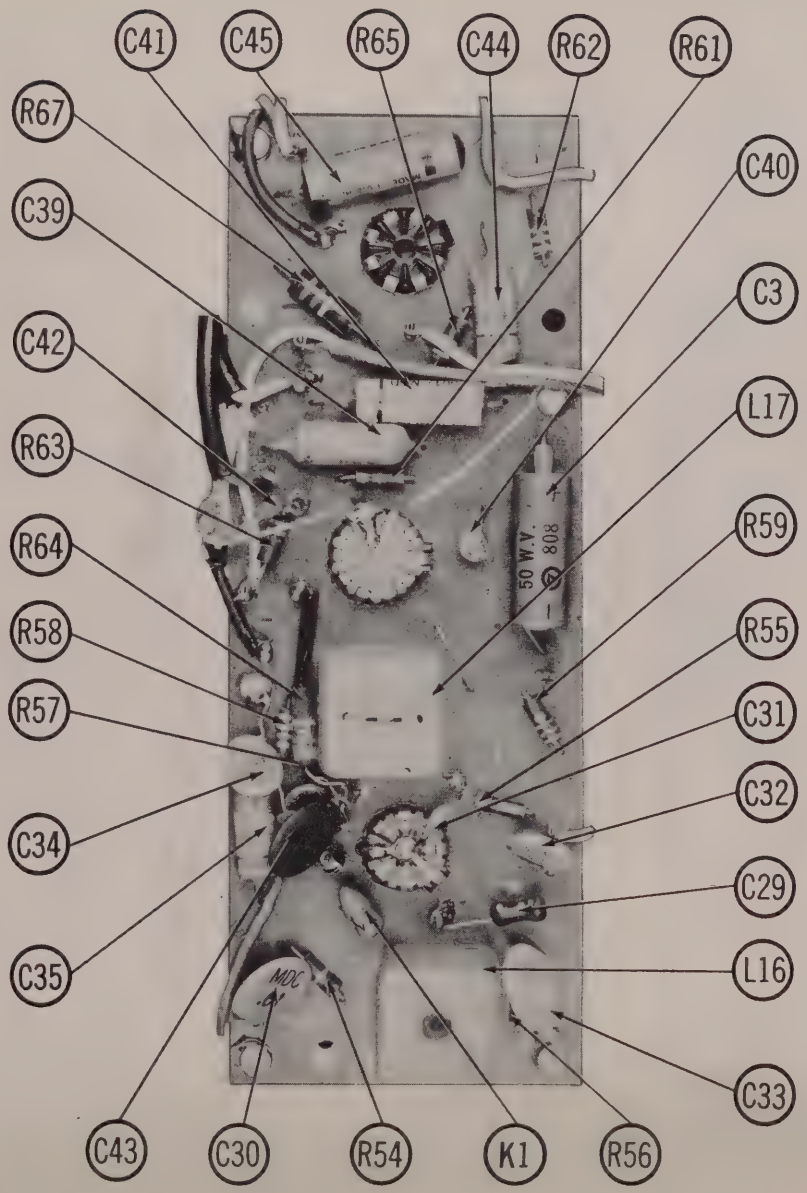
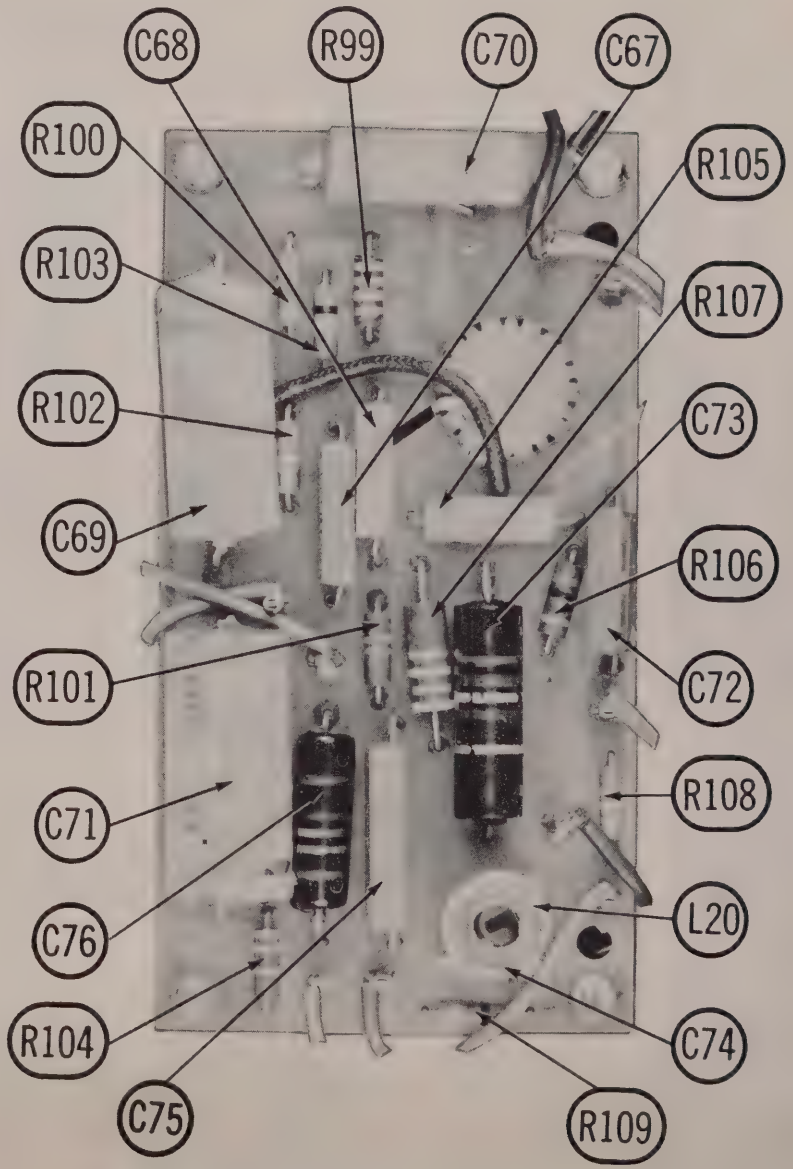


FIG. 5



SOUND PRINTED BOARD



HORIZ PRINTED BOARD

VIDEO, SYNC & AGC
PRINTED BOARD

TUNER ALIGNMENT INSTRUCTIONS (cont)

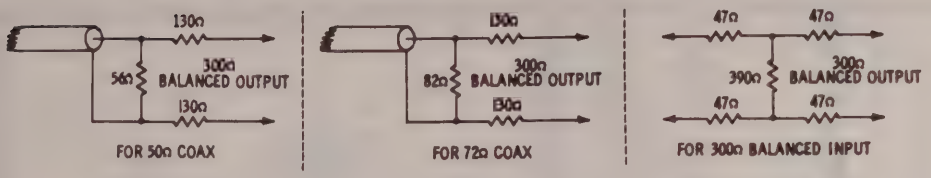


FIG. 201

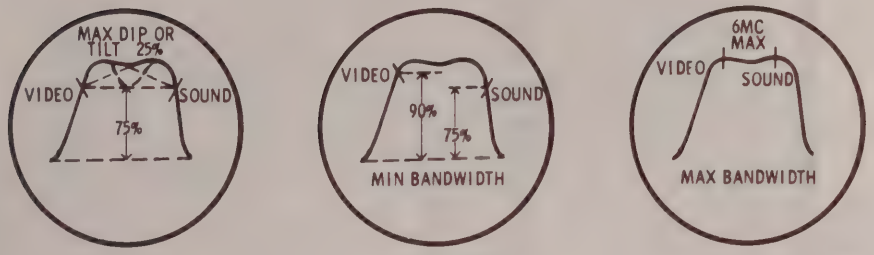


FIG. 202

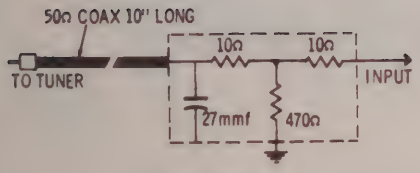


FIG. 203

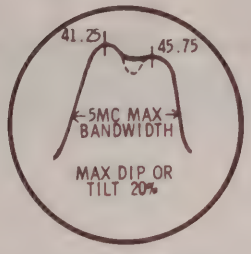


FIG. 204

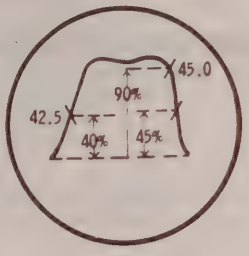
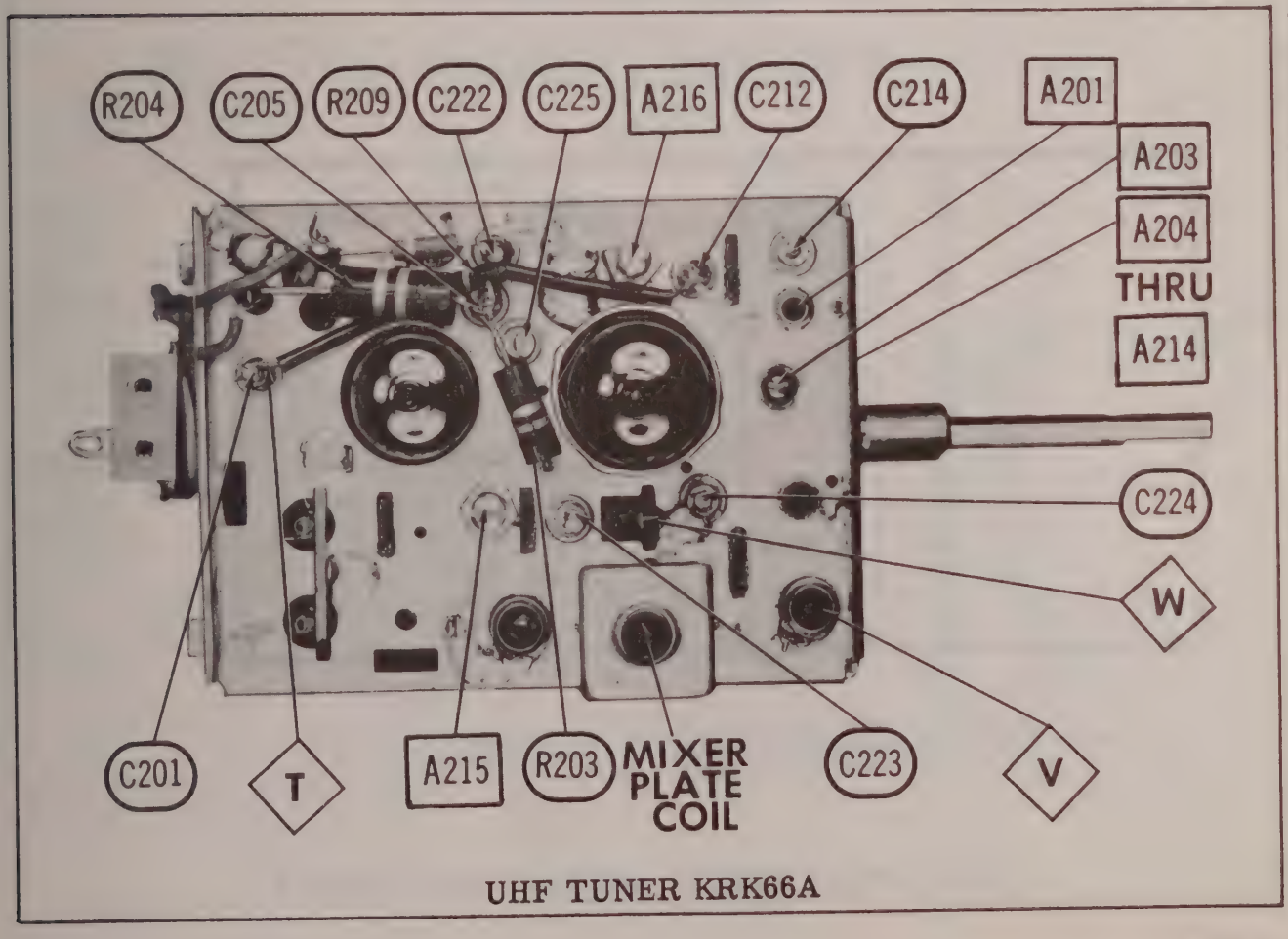
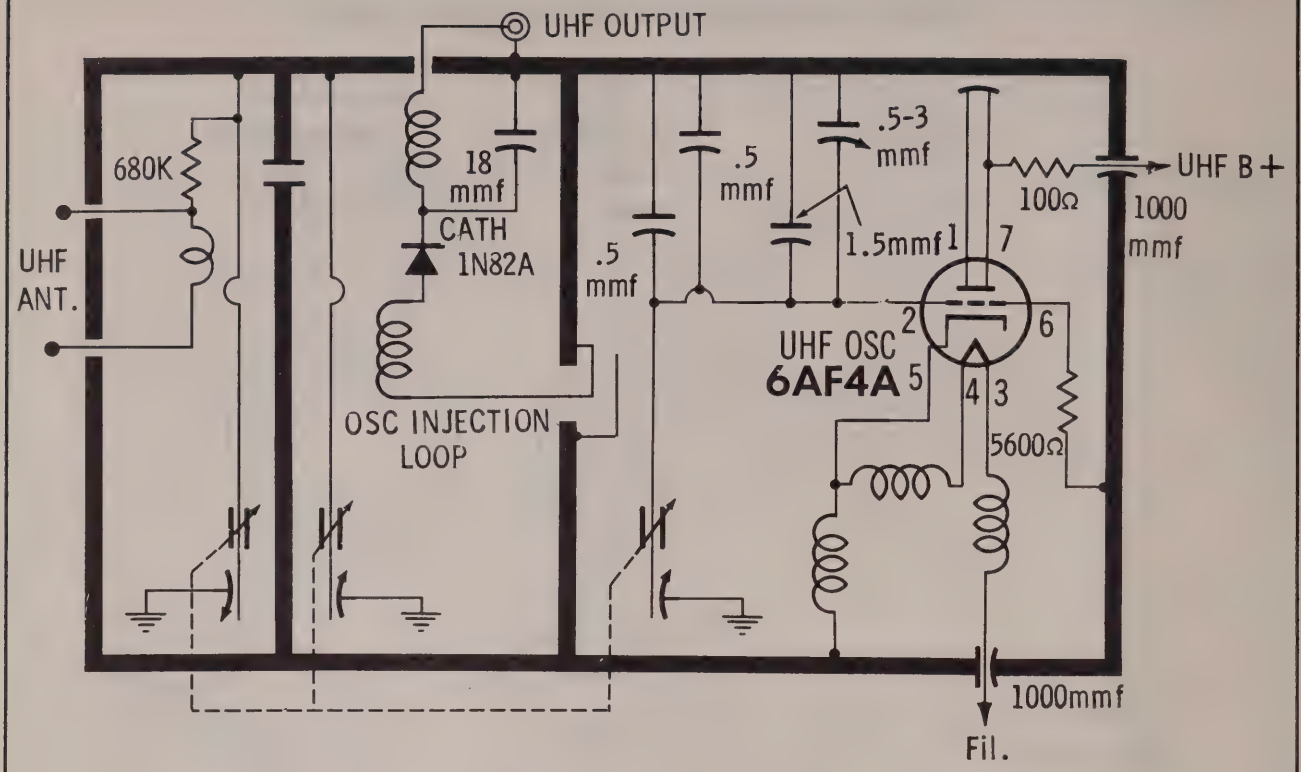


FIG. 205



UHF TUNER KRK66A



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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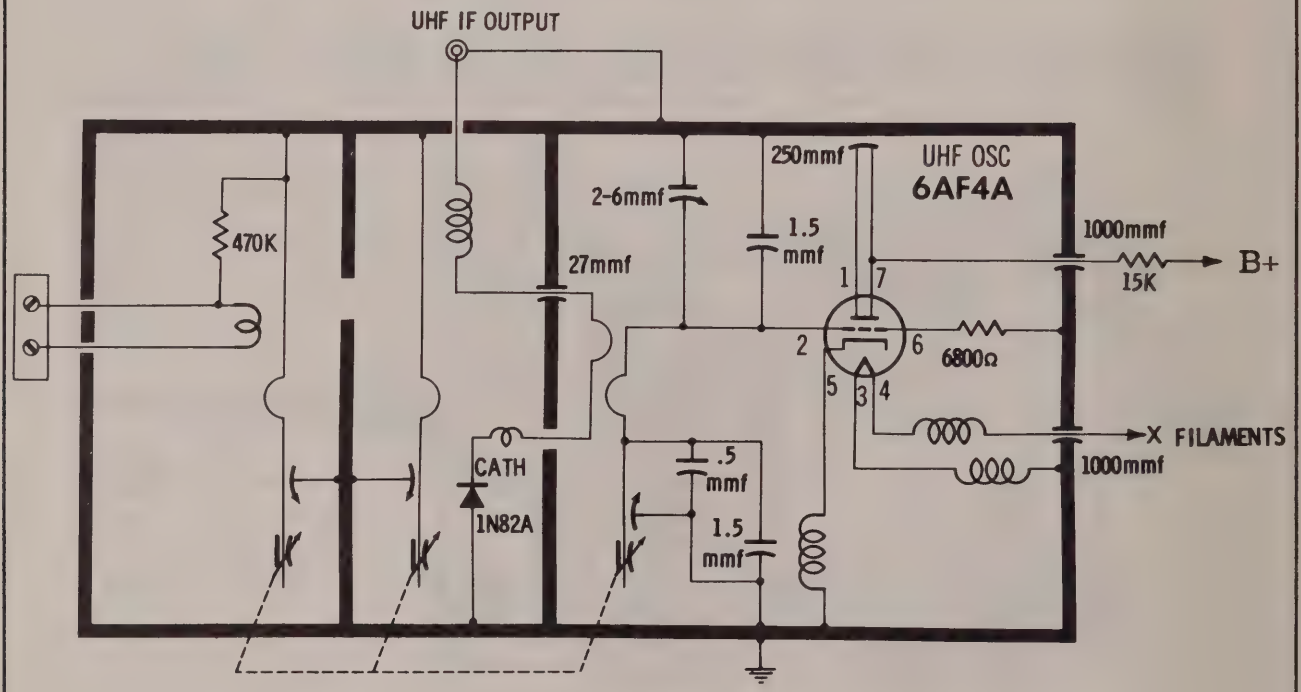
UHF TUNER KRK66A



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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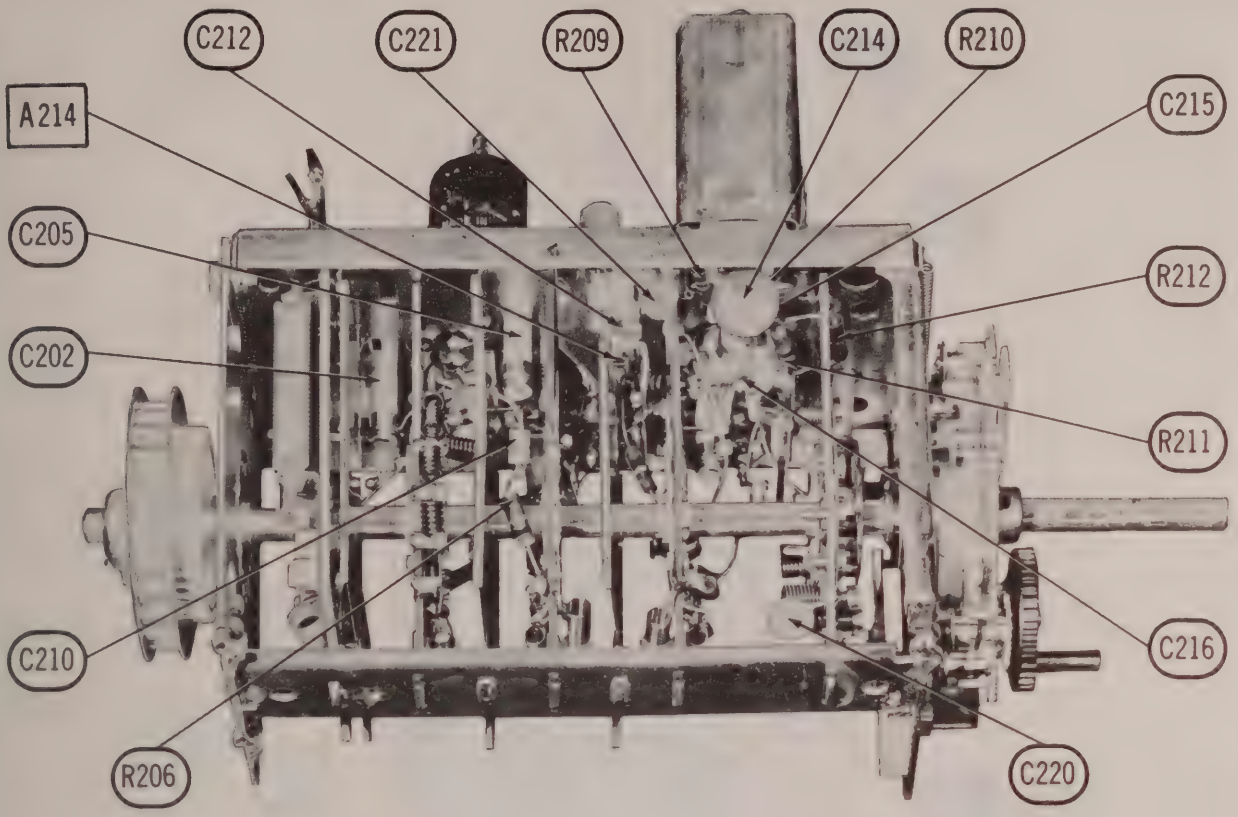
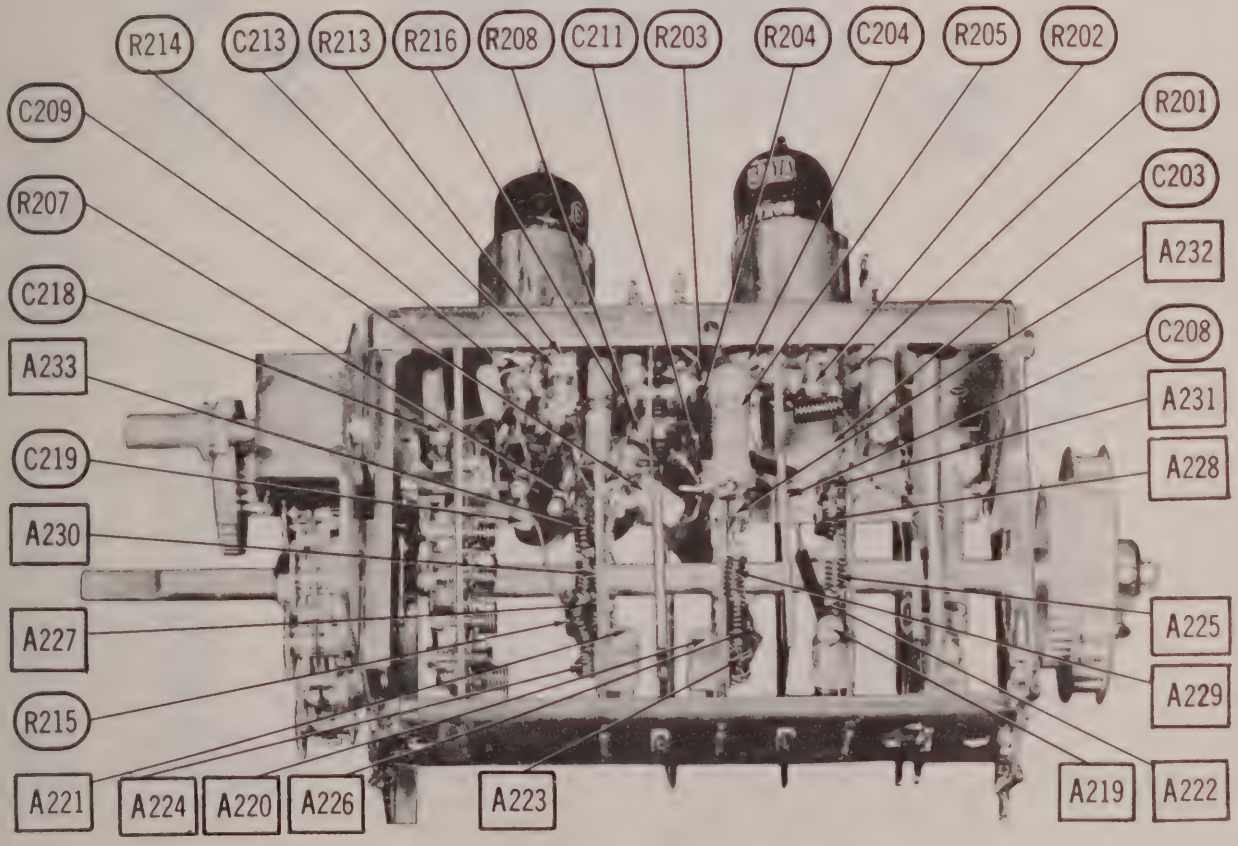
UHF TUNER KRK66A - ALTERNATE CIRCUIT

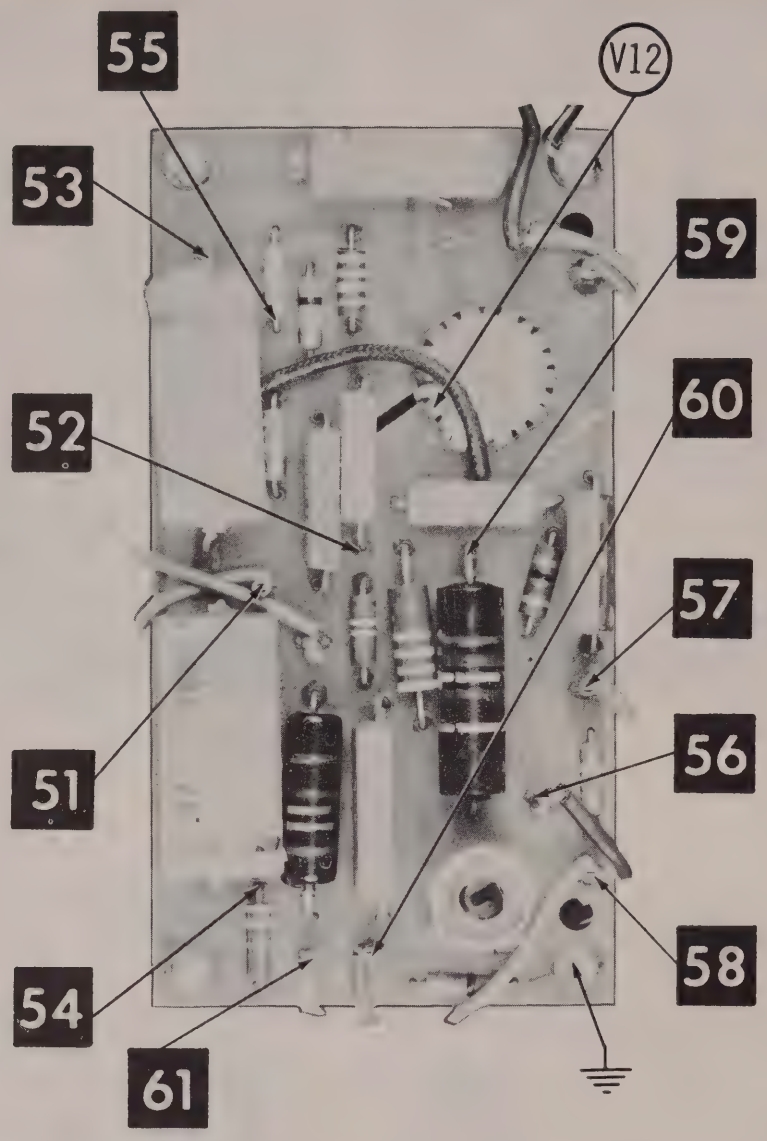


TUNER KRK72E - LEFT SIDE



TUNER KRK72E - RIGHT SIDE

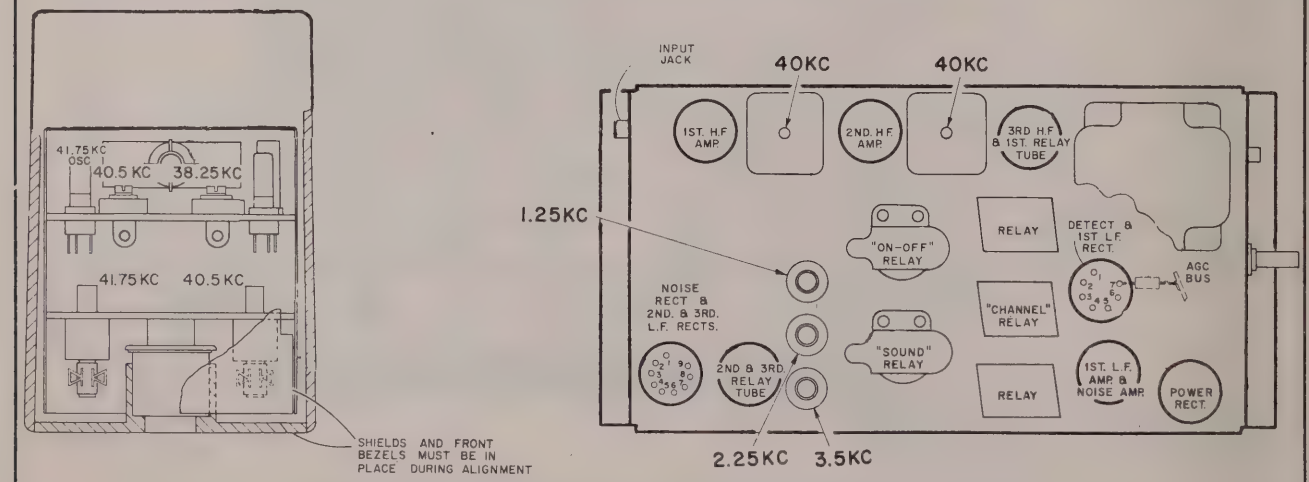
CircuiTrace Numbers 51 thru 61



A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

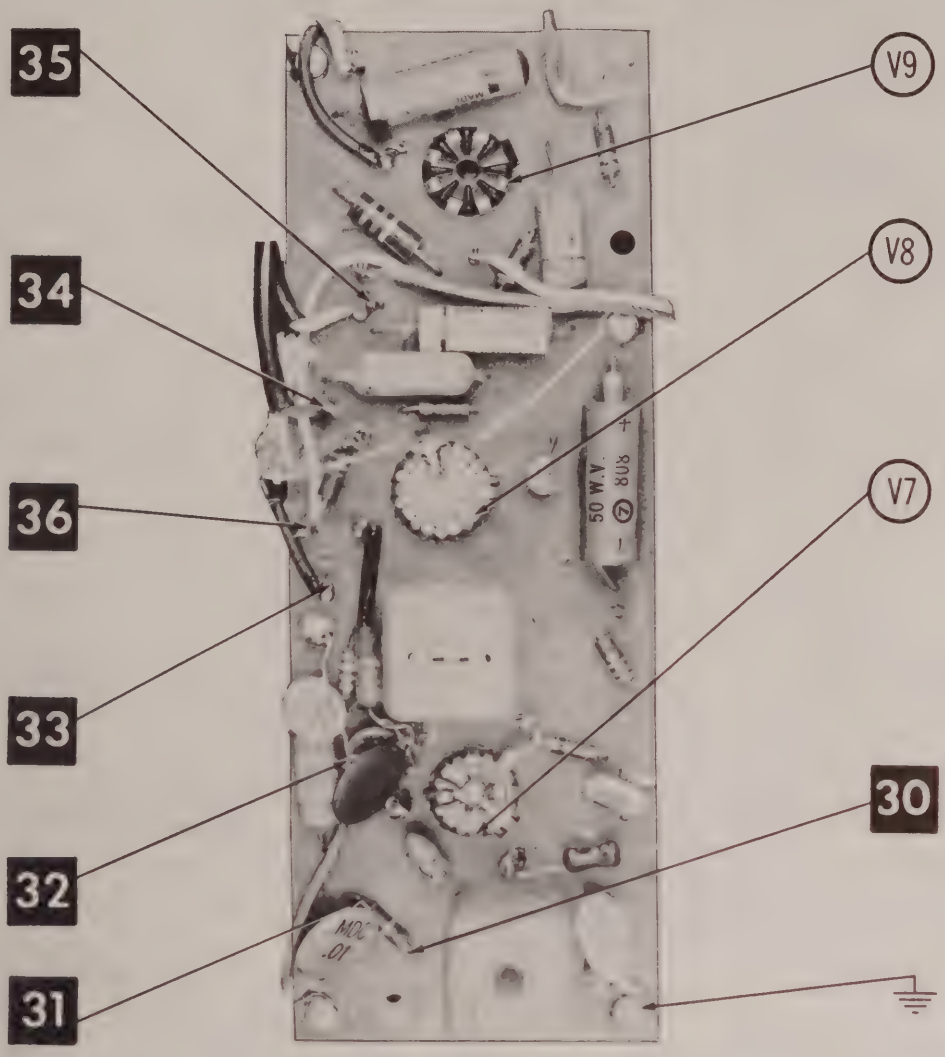
HORIZ PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



REMOTE CONTROL LAYOUT

CircuiTrace Numbers 30 thru 36

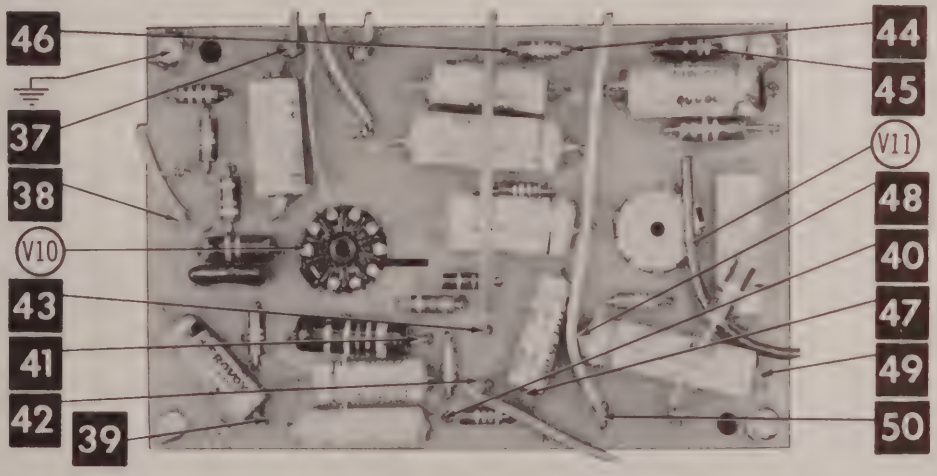


A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

SOUND PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 37 thru 50



A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

SYNC & VERT PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DE6	56K	56Ω	0Ω	.1Ω	††680Ω	††680Ω	0Ω		
V2	6DE6	††13K	††0Ω	0Ω	.1Ω	†680Ω	†680Ω	90K		
V3	6CB6	0Ω	180Ω	.1Ω	0Ω	†4700Ω	†4700Ω	0Ω		
V4	6AW8A	2200Ω	•730K	†33K	.1Ω	0Ω	180Ω	3700Ω	†4500Ω	†11K
V5	6AQ5A	470K	• 1000Ω	0Ω	.1Ω	†3800Ω	†270Ω	470K		
V6	6U8A	†1meg	†20K	†270Ω	0Ω	.1Ω	200K	†3800Ω	0Ω	2.2meg
V7	6AU6	47K	0Ω	0Ω	.1Ω	†5200Ω	†5200Ω	82Ω		
V8	6T8	INF	33K	INF	.1Ω	0Ω	260K	0Ω	10meg	†330K
V9	6AQ5A	470K	560Ω	0Ω	.1Ω	†3600Ω	†3300Ω	470K		
V10	6CG7	†19K	33K	0Ω	0Ω	.1Ω	• ‡2.3meg	•2.2meg	0Ω	0Ω
V11	6CZ5	†170Ω	NC	• 1.3meg	0Ω	.1Ω	• 1.3meg	0Ω	NC	†480Ω
V12	6CG7	†0Ω	1.2meg	180K	0Ω	.1Ω	†47K	190K	0Ω	0Ω
V13	6DQ6A	NC	0Ω	TP	†5600Ω	650K	NC	.1Ω	100Ω	TOP CAP ‡16Ω
V14	6AU4GTA	NC	NC	¶6meg	NC	†9Ω	NC	.1Ω	0Ω	
V15	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡380Ω
V16	5AS4A	NC	¶	NC	22Ω	NC	20Ω	NC	¶	
V17	21CEP4	0Ω	380K	‡280K	†0Ω	NC	NC	120K	.1Ω	
V201	6BQ7A	†1800Ω	500K	600K	0Ω	.1Ω	600K	270K	0Ω	0Ω
V202	6CQ8	†900Ω	100K	INF	.1Ω	0Ω	INF	0Ω	INF	INF
ITEM	TYPE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

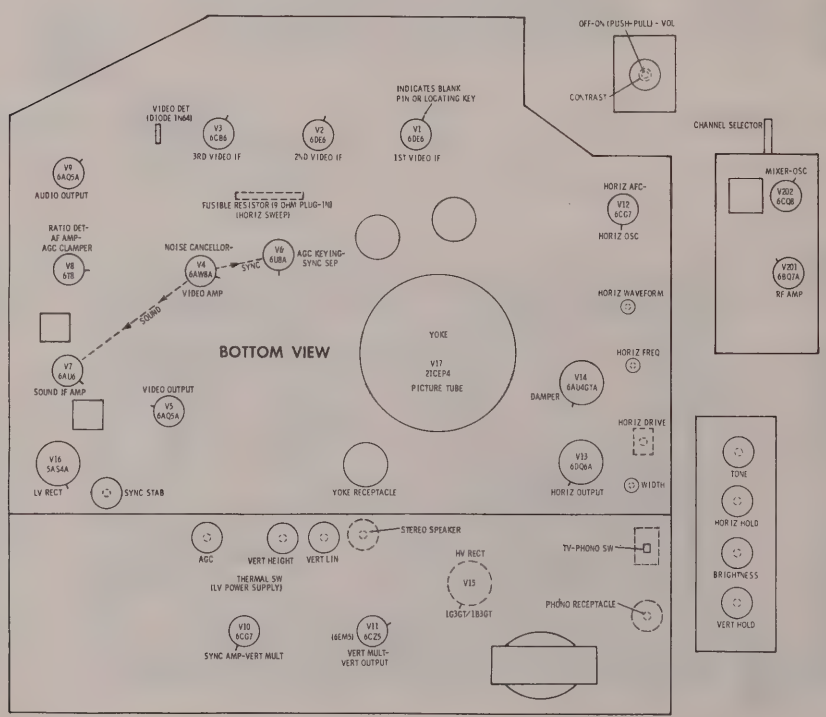
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

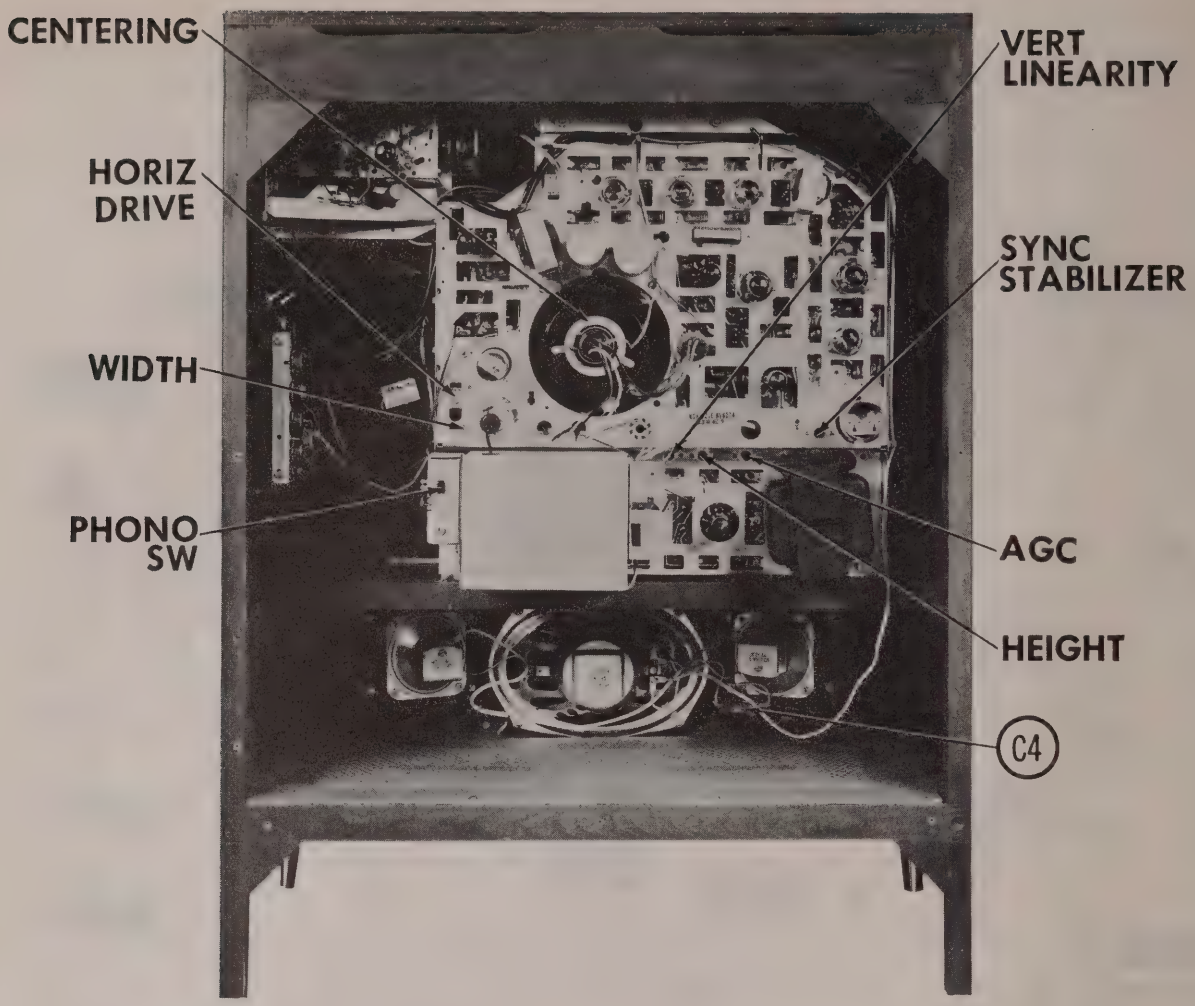
† MEASURED FROM 270V SOURCE.

†† MEASURED FROM PIN 7 OF V2. NC NO CONNECTION.

‡ MEASURED FROM PIN 3 OF V14 TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short clip lead across the Horizontal Waveform coil (L20) and adjust the Horizontal Hold until the picture pulls into sync. Remove the clip lead.

Connect the vertical amplifier of a scope thru a low capacity probe to point (F). Low side to chassis. Turn the Horizontal Hold clockwise until the picture falls out of sync, then counterclockwise until the picture just pulls into sync. Adjust the Horizontal Waveform slug (B1) until the waveform on the scope appears similar to that shown in Fig. 6 with peaks of equal amplitudes. If necessary during this adjustment, keep the picture in sync with the Horizontal Hold. Remove the scope connections.

Turn the Horizontal Hold until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the control counterclockwise and note the number of diagonal bars obtained just before the picture falls into sync. Pull-in should occur with one and one-half to three bars present. Set the Width slug (B3) fully counterclockwise.

With the Horizontal Hold set at the pull-in point, adjust the Horizontal Drive trimmer (B2) counterclockwise until a bright vertical line appears in the center of the picture. Turn B2 clockwise until the drive line appears. Turn B2 clockwise until the drive line disappears. If no drive line appears, set B2 fully counterclockwise.

Set the Brightness and Contrast to normal and adjust the Width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

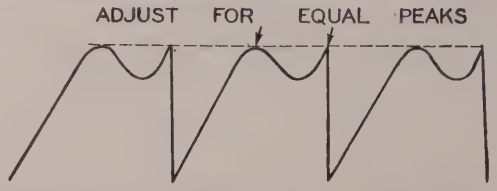


FIG. 6

PHOTOFACT* Folder

EIA ELECTRONIC INDUSTRIES ASSOCIATION MEMBER

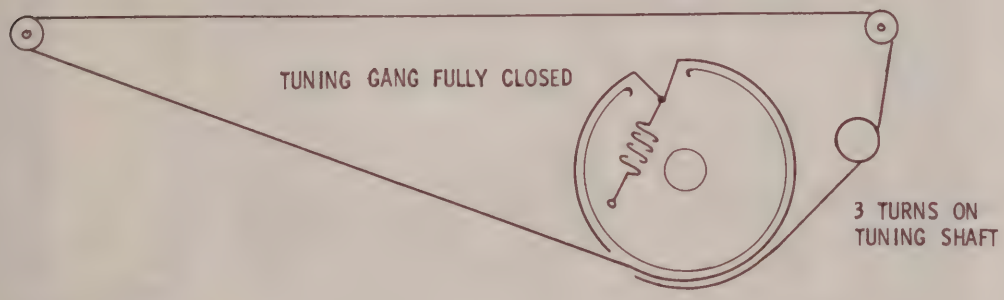
DEWALD MODEL L-803A

DEWALD MODEL L-803A

DEWALD MODEL L-803A

TRADE NAME	DeWald Model L-803A		
MANUFACTURER	DeWald Radio Mfg. Corp., 35-15 37th Ave., Long Island City 1, N. Y.		
TYPE SET	AC Operated FM-AM Tuner		
TUBES (Seven)	Types 6U8A FM RF Amp.-FM Mixer, 12AT7 FM Osc.-FM AFC, 6BE6 AM Converter, 6BA6 1st FM AM IF Amp., 6AU6 2nd FM IF Amp.-AM Det.-AVC, 6AU6 FM Limiter, 6AL5 Discriminator		
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING	.28 Amp. @ 117 Volts AC (26 Watts) FM
TUNING RANGE - BROADCAST	535 - 1650KC	FREQ. MOD.	88 - 108MC

DIAL CORD STRINGING



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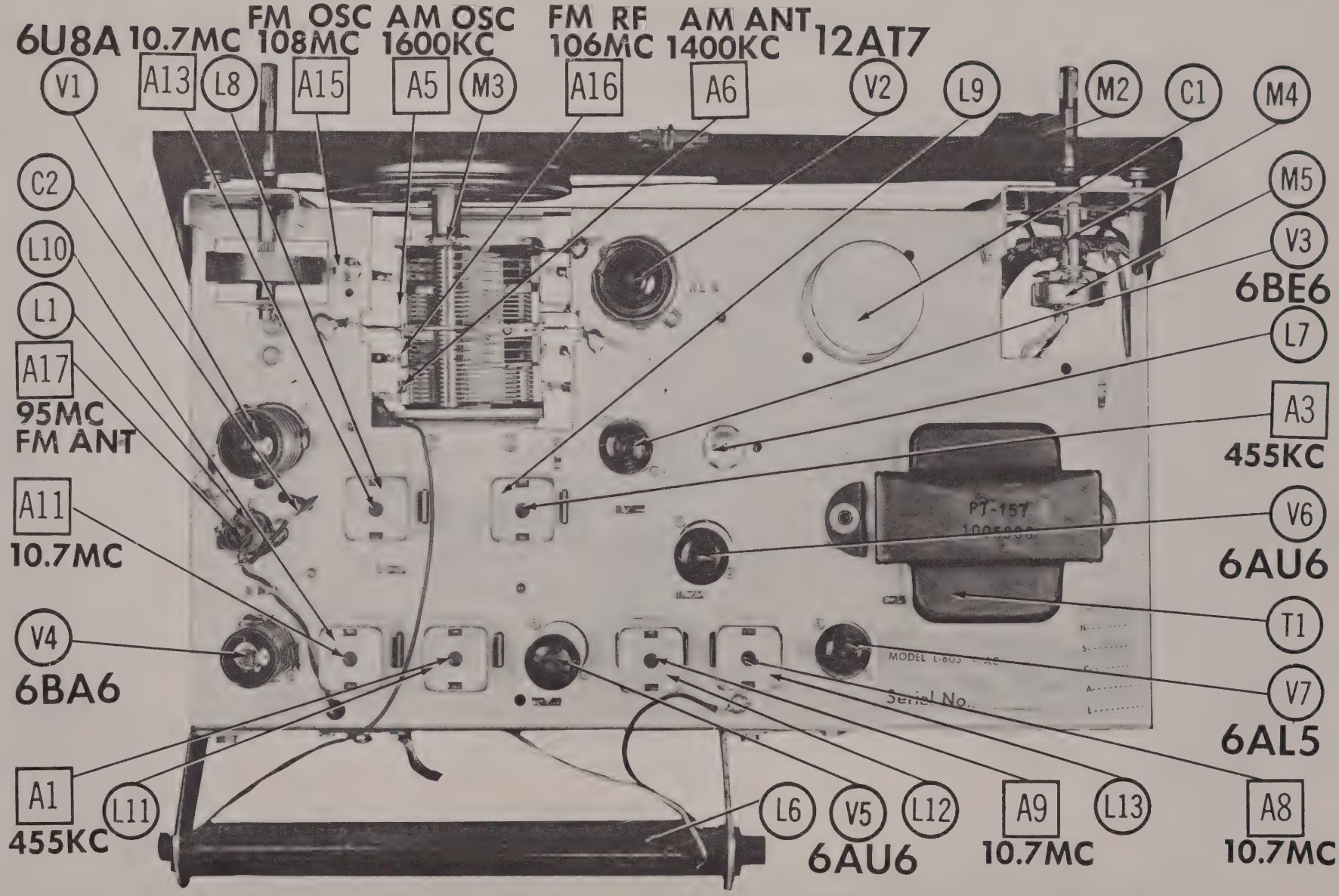
H647



CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400~ Mod)	AM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	High side to AM antenna terminal. Low side to chassis.	1600KC	"	1600KC	"	A5	"
3.	"	"	1400KC	"	Tune to 1400KC signal	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	200mmf	High side to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe thru 1meg to point (B). Common to chassis.	A7	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	"	High side to pin 9 (grid) of 6U8 (V1). Low side to chassis.	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	200mmf	High side to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 1meg to point (B). Low side to chassis.	A7	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A8	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.
6.	"	High side to pin 9 (grid) of 6U8 (V1). Low side to chassis.	"	"	"	Vert. Amp. thru 1meg to point (B). Low side to chassis.	A9, A10, A11, A12, A13, A14	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108MC (Unmod)	FM	108MC	DC probe thru 1meg to point (B). Common to chassis.	A15	Adjust for maximum deflection.
8.	"	"	106MC	"	Tune to 106MC signal	"	A16	"

FIG. 1

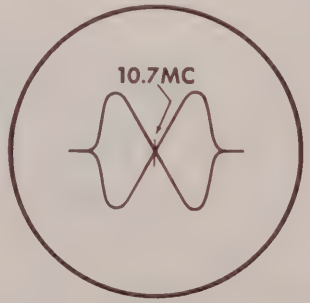
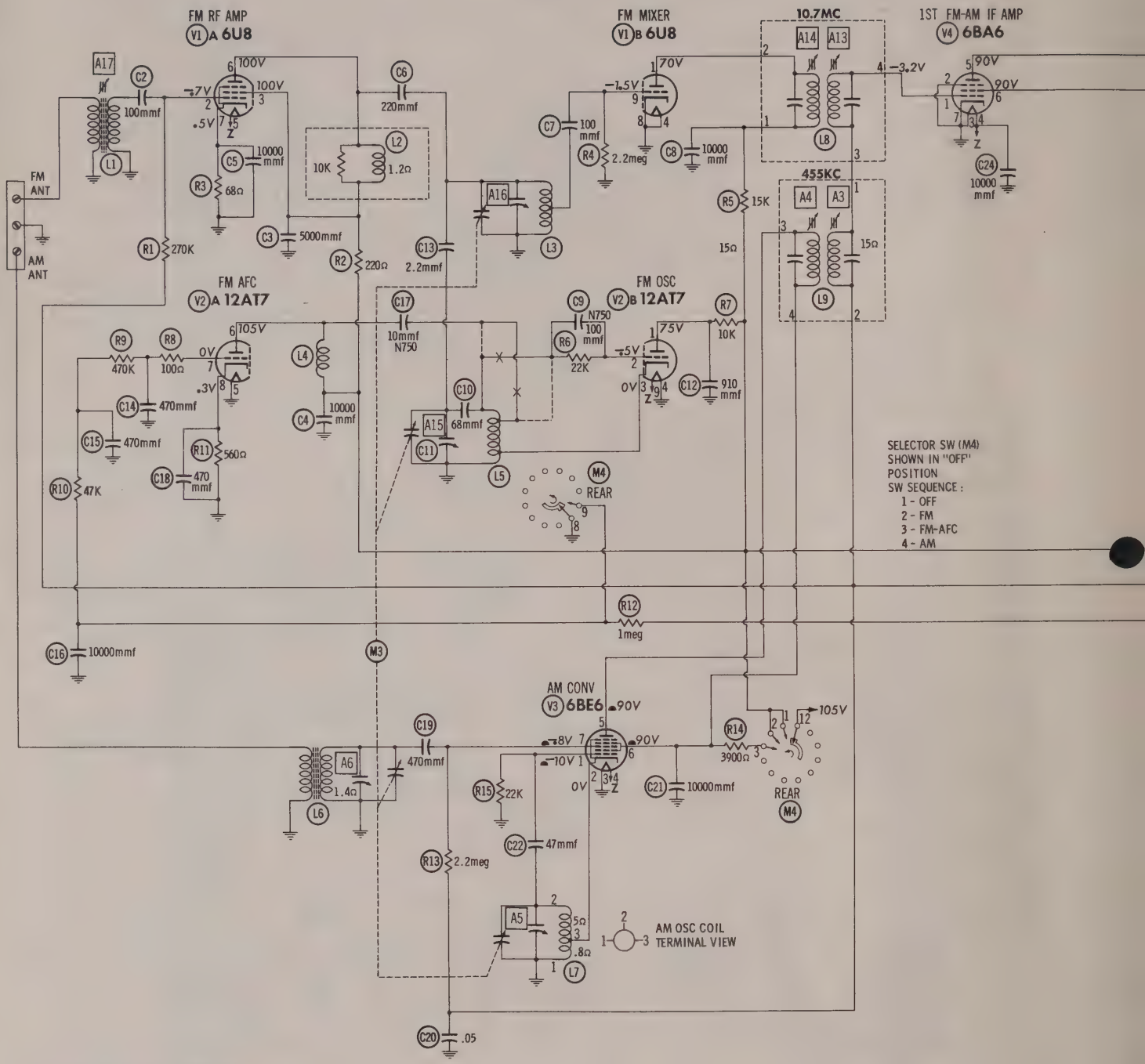


FIG. 2

DEWALD MODEL L-803A

FOLDER 4



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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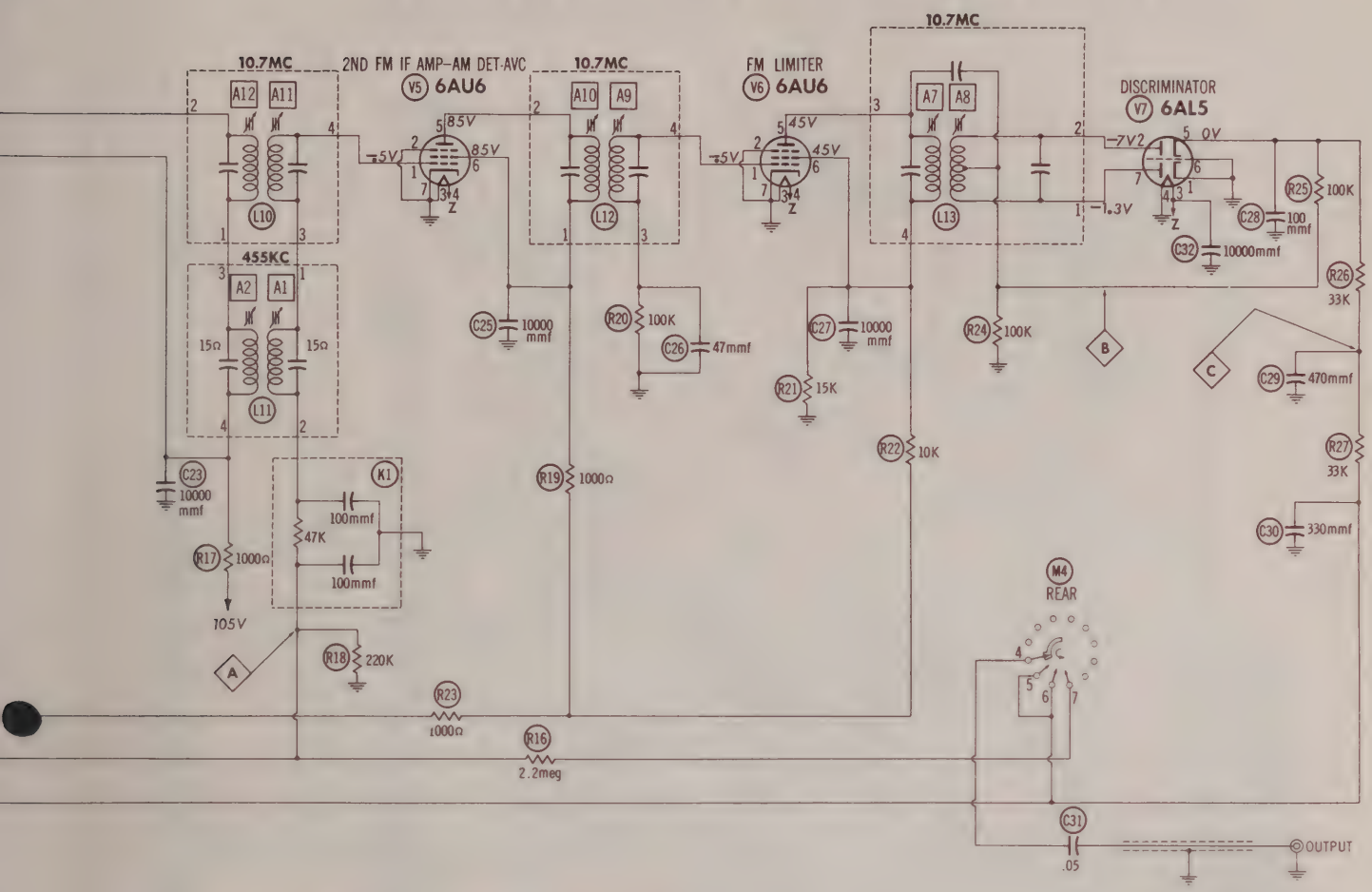
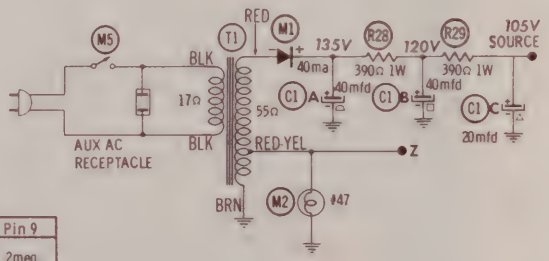


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

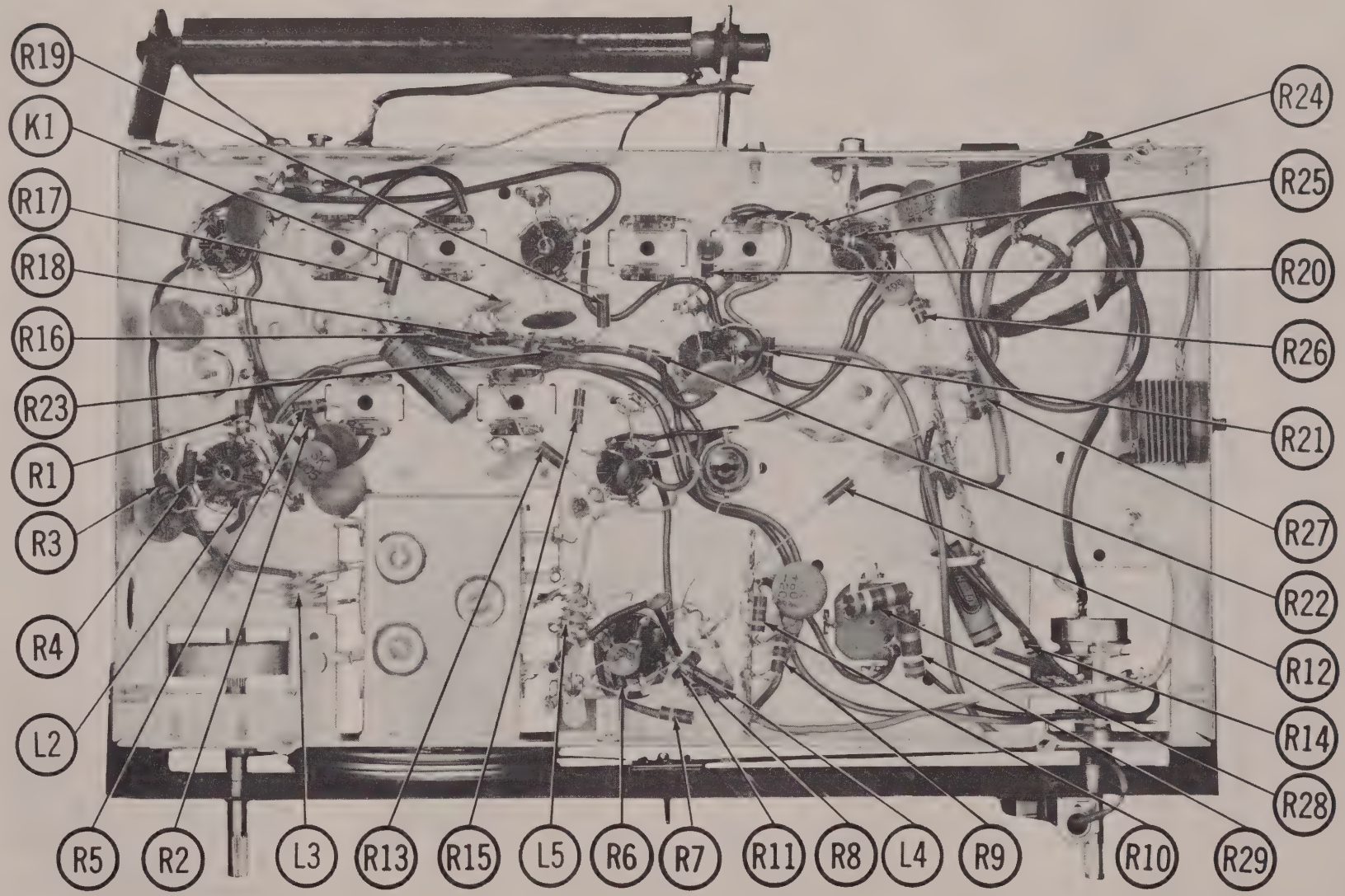


RESISTANCE READINGS

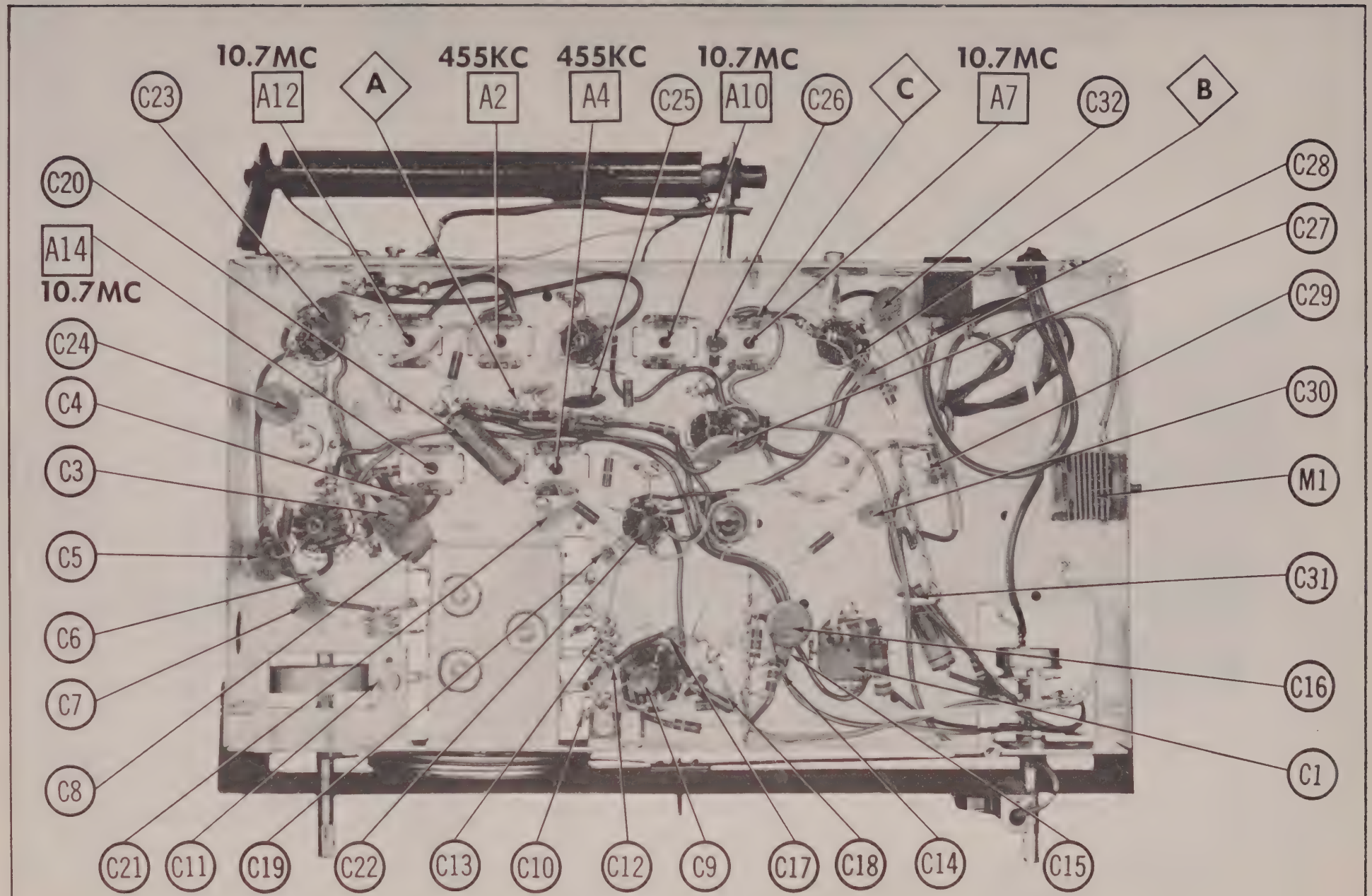
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6U8A	†15K	2.7meg	†1000Ω	0Ω	.1Ω	†1000Ω	68Ω	0Ω	2.2meg
V2	12AT7	†10K	22K	0Ω	0Ω	0Ω	†800Ω	520K	560Ω	.1Ω
V3	6BE6	▪22K	▪.8Ω	0Ω	.1Ω	†▪4700Ω	†▪4700Ω	▪4.6meg		
V4	6BA6	2.4meg	0Ω	0Ω	.1Ω	†1800Ω	†1800Ω	0Ω		
V5	6AU6	260K	0Ω	0Ω	.1Ω	†2800Ω	†2800Ω	0Ω		
V6	6AU6	100K	0Ω	0Ω	.1Ω	†10K	†10K	0Ω		
V7	6AL5	0Ω	100K	.1Ω	0Ω	160K	0Ω	100K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M1
▪ MEASURED IN "AM" POSITION

419-4



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW - ALIGN, CAPACITOR & MISC IDENT

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.-FM Mixer	6U8A	
V2	FM Osc.-FM AFC	12AT7	
V3	AM Converter	6BE6	
V4	1st FM-AM IF Amplifier	6BA6	
V5	2nd FM IF Amp. - AM Det. - AVC	6AU6	
V6	FM Limiter	6AU6	
V7	Discriminator	6AL5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA DEWALD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	◓ 40	200		AFHS3-94	C0150	FP320	TMT-19	T-085	R2677*
B	■ 40	200			BR3025	TC55	TD-30-250	MT-4530	
C	▲ 20	200							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C3	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C4	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C5	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C6	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C7	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C8	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C9	100			N750-DI100	DTN-100	C10T1U	NT-531	5TCU-T1	N750
C10	68			SI68	D6-680	LT6Q68	UC-5468	5GA-Q68	
C11									
C12	910			NPO-SI2.2	TCZ-2R2	CTA6V22C		5TCCB-V22	
C13	2.2			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C14	470			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C15	470			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C16	10000			N750-DI10	DTN-10	C10Q1U	NT-541	5TCU-Q1	N750
C17	10			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C18	470			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C19	470			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C20	.05	200		BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C21	10000			BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C22	47			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C23	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C24	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C25	10000			BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C26	47			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C27	10000			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C28	100			BPD-00047	DD-470	L10Q47	UC-5347	5GA-T47	
C29	470			BPD-00033	DD-330	L10T33	UC-5333	5GA-T33	
C30	330			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C31	.05	200		BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C32	10000								

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	DEWALD PART No.	NOTES
R1	270K			
R2	220Ω			
R3	68Ω			
R4	2.2meg			
R5	15K			
R6	22K			
R7	10K			
R8	100Ω			
R9	470K			
R10	47K			
R11	560Ω			
R12	1meg			
R13	2.2meg			
R14	3900Ω			
R15	22K			
R16	2.2meg			
R17	1000Ω			
R18	220K			
R19	1000Ω			
R20	100K			
R21	15K			
R22	10K			
R23	1000Ω			
R24	100K			
R25	100K			
R26	33K			
R27	33K			
R28	390Ω	1		
R29	390Ω	1		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA DEWALD PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.			SW-631 *			4.7 Microhenries; wound on a 10K resistor
L2	RF Choke						
L3	FM RF Coil						2.7 Microhenries
L4	RF Choke		19-1002	BC-563	4606		
L5	FM Osc. Coil						
L6	Loop Stick						
L7	AM Osc. Coil						
L8	1st FM IF		16-3487	FM-254	1463		
L9	1st AM IF		16-6758	BC-352	12-C1	RF-1	
L10	2nd FM IF		16-3487	FM-254	1463		
L11	2nd AM IF		16-6758	BC-353	12-C2	RF-2	
L12	3rd FM IF		16-3487	FM-254	1463		
L13	Discriminator		17-3491	FM-253	1464		

* Parallel with 10K Resistor.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA DEWALD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② .28A	120V ② .040A Tap ② 6.3V ② 2.3A		PT-157	P9102	P-3045		PA8421	26R38	R-30X

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DEWALD PART No.	REPLACEMENT DATA
K1	Diode RF Filter	100mmf, 100mmf, 47K		Aerovox PA-97-1 Centralab PC-50 Cornell-Dubilier 111TM1 Sprague D-1

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA DEWALD PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.04A		1234AH	RS075	75 M150 ①	① Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M2	Lamp		#47
M3	Tuning Cap.	222-2	4 Gang (AM Sections: Ant. 12-247mmf, Osc. 13-122mmf)
M4	Switch		Selector, Four position, Three pole rotary wafer
M5	Switch		Power On-Off, Rotary Snap Switch

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

GRUNDIG MAJESTIC MODEL 7028

GRUNDIG MAJESTIC
MODEL 7028

GRUNDIG MAJESTIC
MODEL 7028

TRADE NAME	Grundig Majestic Model 7028
SUPPLIER	Majestic International Sales Corp., 743 LaSalle St., Chicago 10, Illinois
TYPE SET	AC Operated FM-BC-SW Receiver With 4 Speed Automatic Record Changer
TUBES (Nine)	Types ECC85/6AQ8 FM RF Amp.-1st FM IF Amp.-FM Conv., ECH81/6AJ8 2nd FM IF Amp.-AM Mixer-AM Osc., EBF89 3rd FM-1st AM IF Amp.-AM Det.-AVC, EAA91/6AL5 Ratio Det., EM34-35/6CD7 Tuning Indicator, ECC83/12AX7 Phono Preamp.-AF Amp., EC92/6AB4 Phase Inverter, (2) EL95 Output
POWER SUPPLY	110/220 Volts AC-60 Cycles RATING .54 Amp. @ 117 Volts AC (53 Watts)

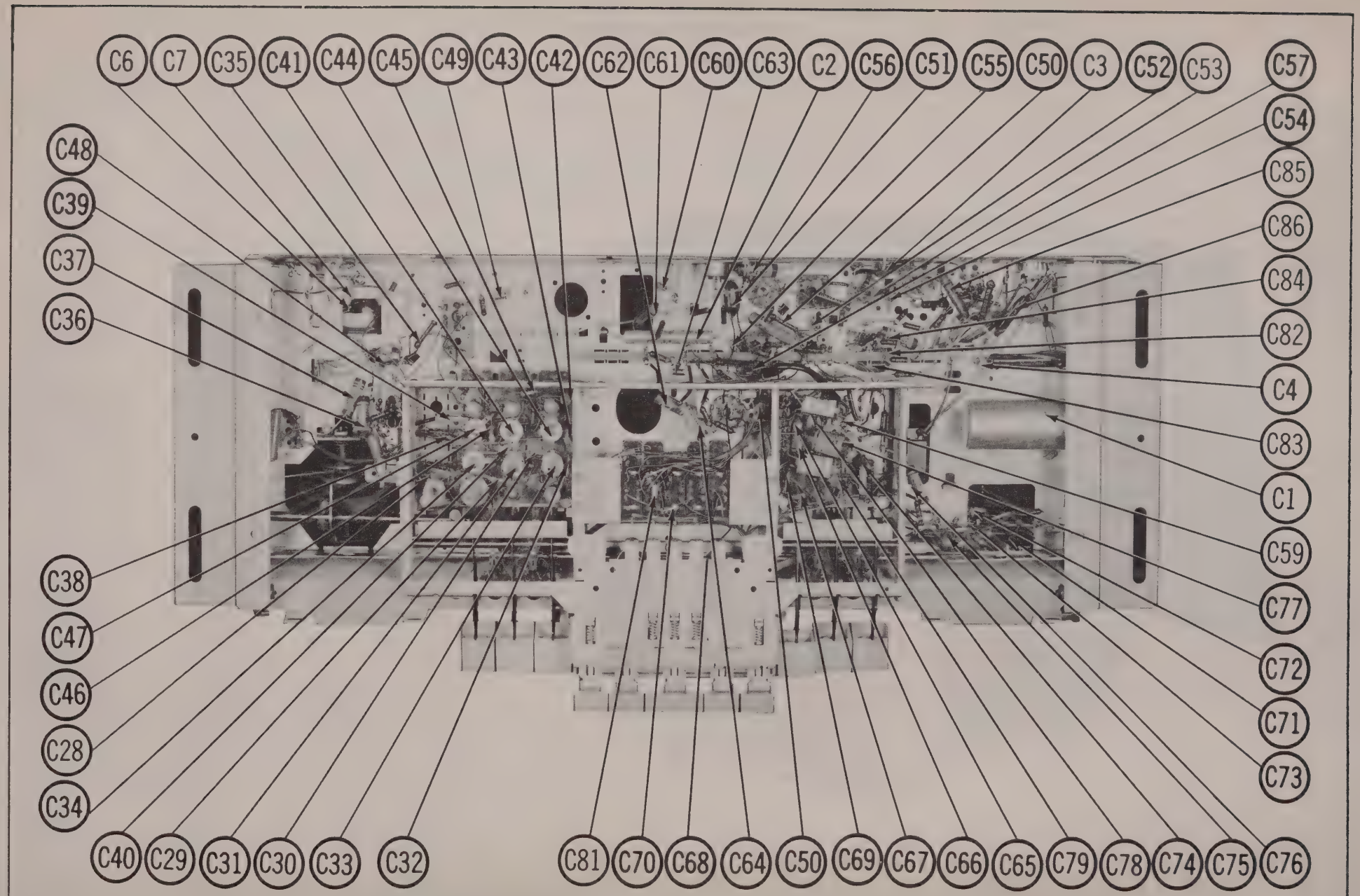
TUNING RANGES

FREQ. MOD.	88-108MC	SHORT WAVE I	3.2-8.5MC
BROADCAST	510-1620KC	SHORT WAVE II	8.3-18.5MC

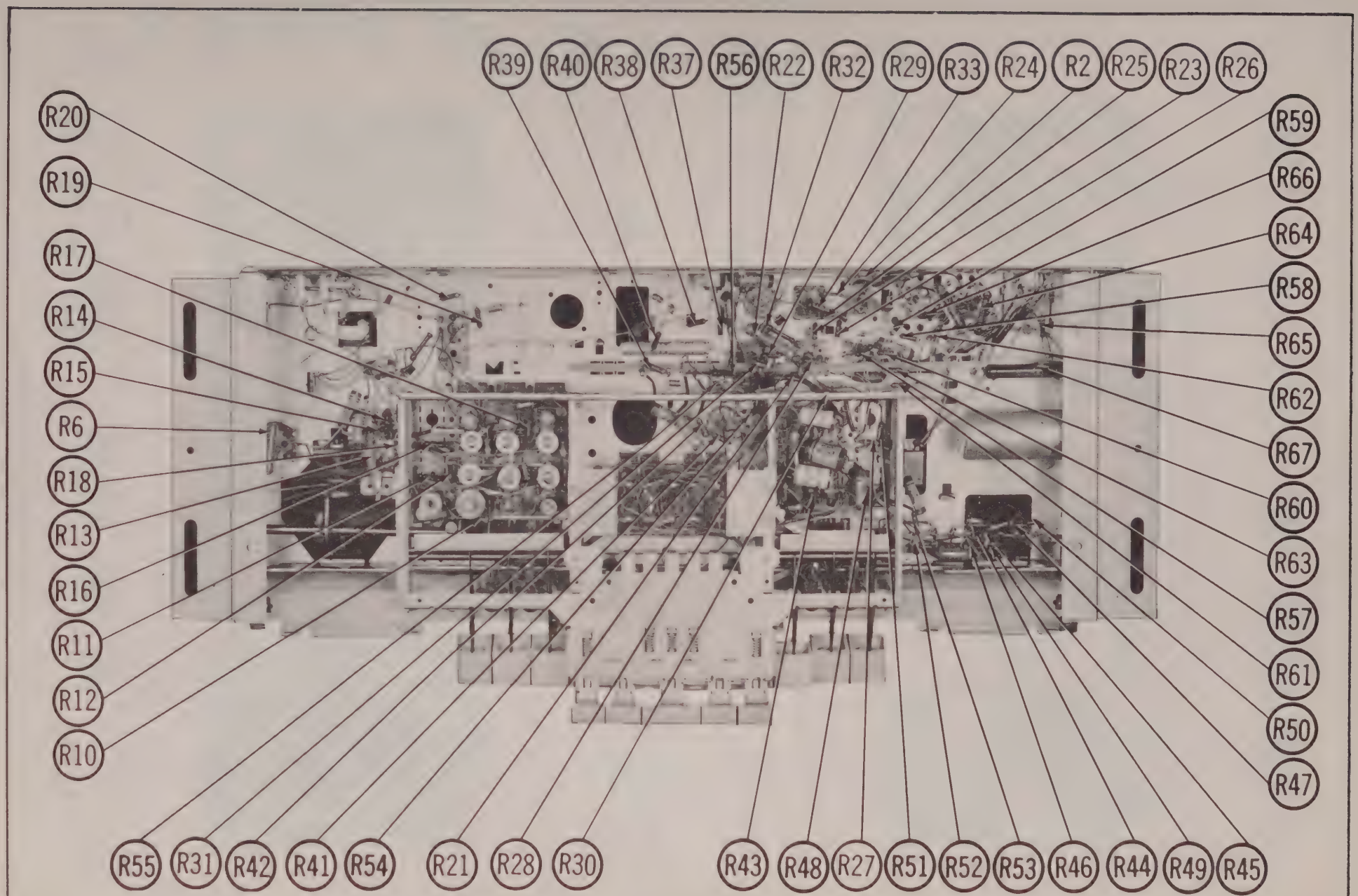
FOR SERVICE INFORMATION ON RECORD CHANGER - SEE PERPETUUM EBNER REX AA - PHOTOFACT SET 378 FOLDER 10

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

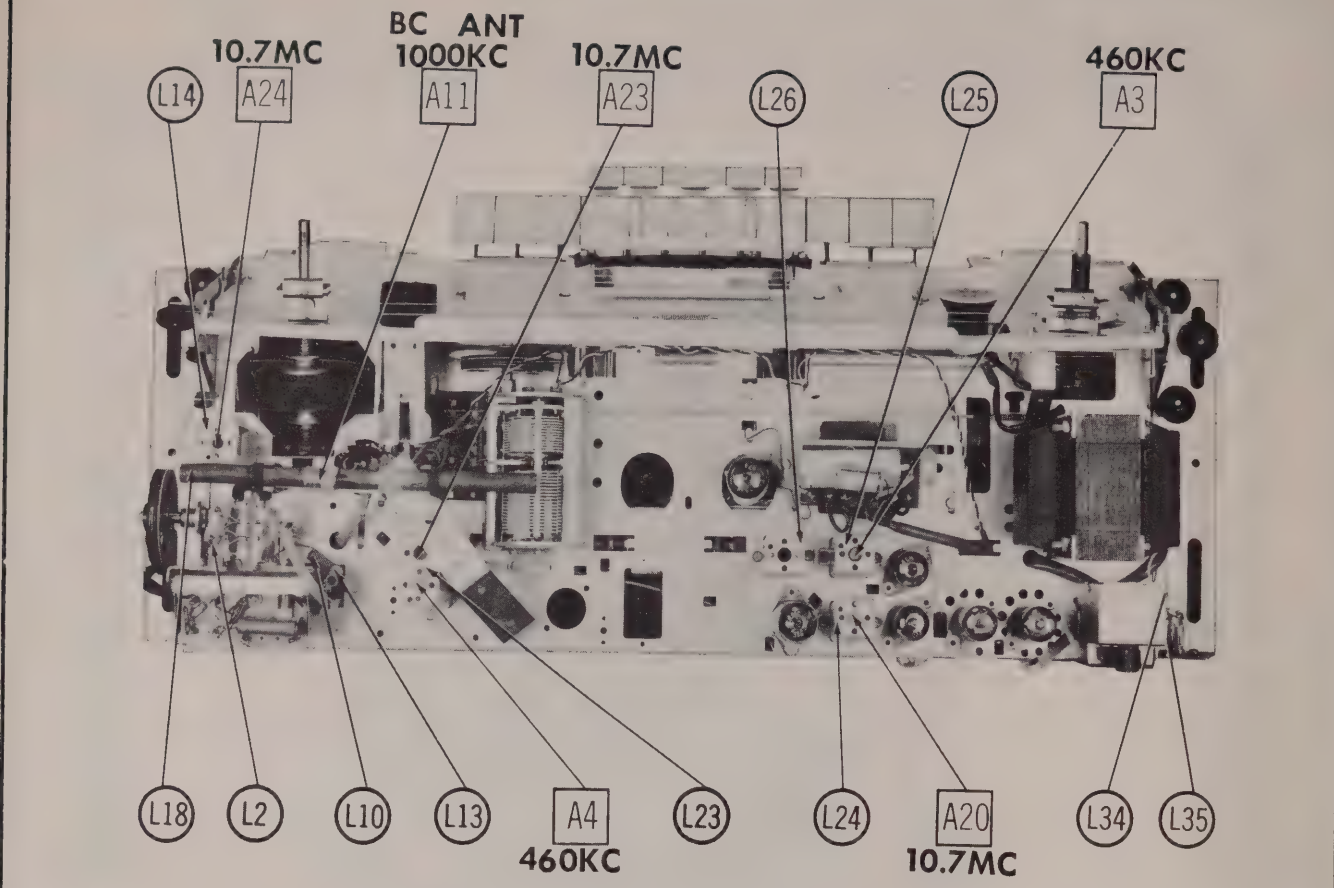
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

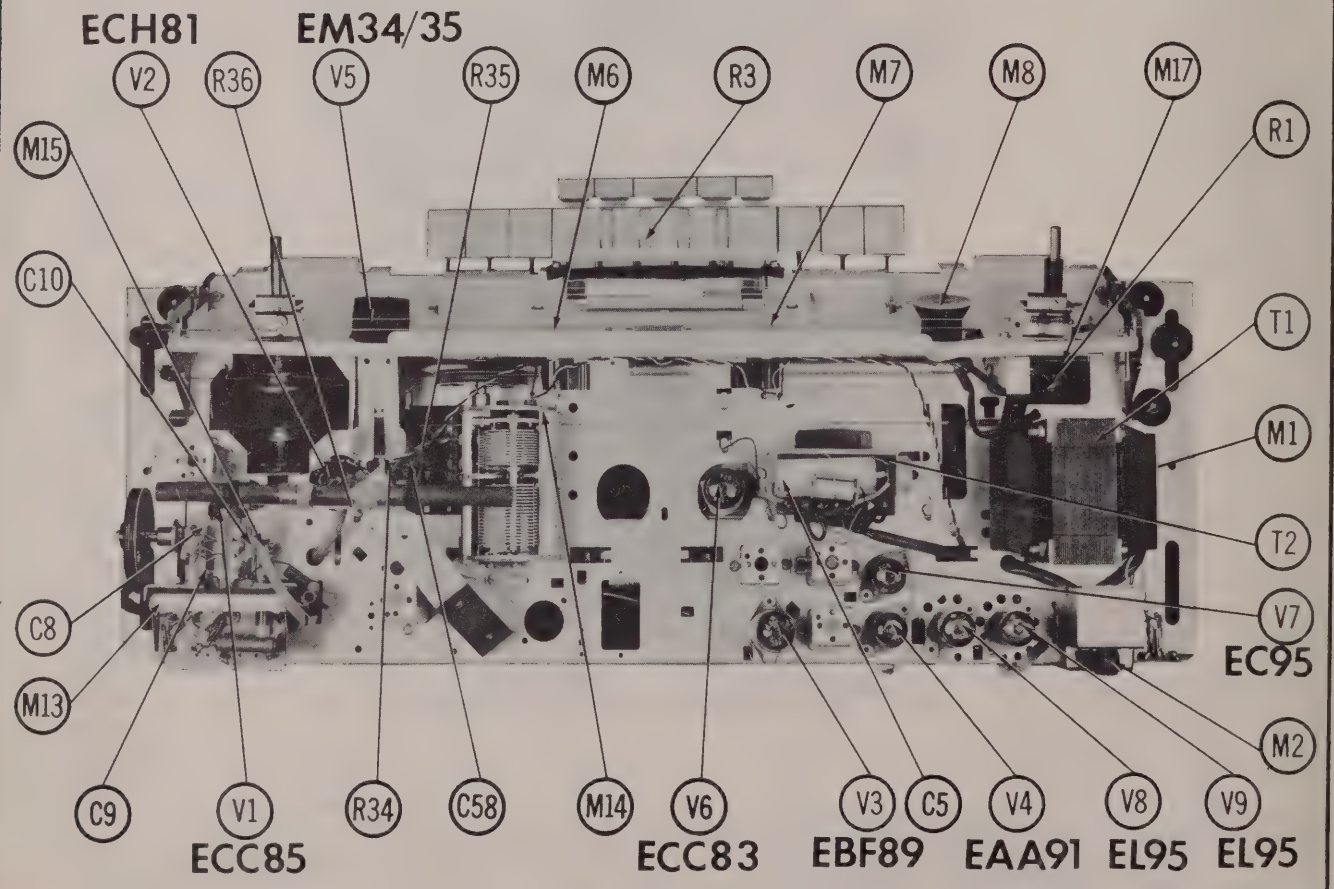


CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

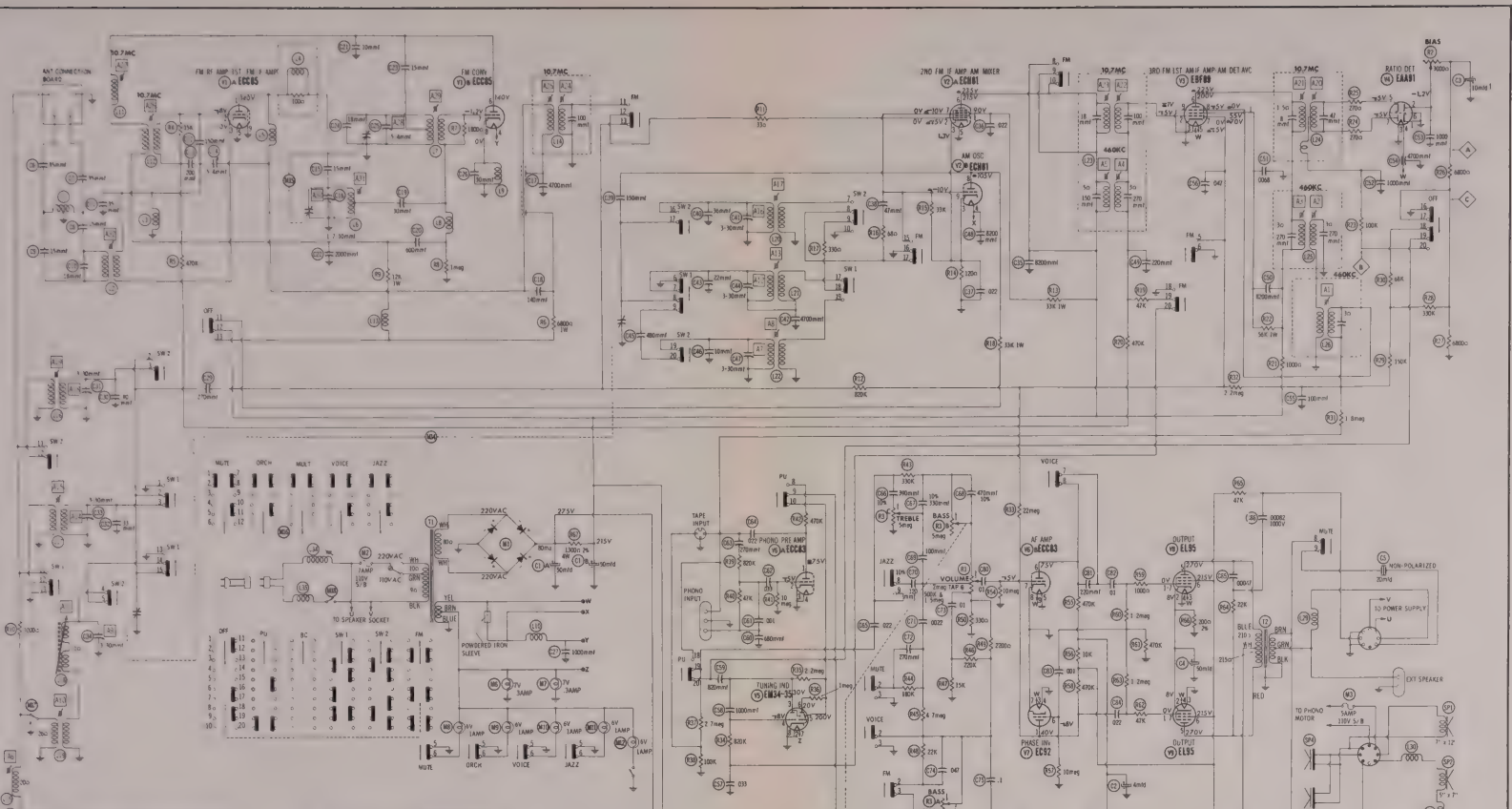


CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION





CHASSIS TOP VIEW



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE ON APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	†810Ω	1meg	2Ω	1Ω	0Ω	†13K	1meg	1Ω	0Ω
V2	ECH81 6AJ8	† 14K	33Ω	120Ω	1Ω	0Ω	†1300Ω	0Ω ±33K	+34K	+33K
V3	EBF89	†58K	47K ±220MΩ	0Ω	0Ω	1Ω	†2000Ω	0Ω ±22MΩ	190K ±400K	0Ω
V4	EAA91 6AL5	0Ω	16K ±700Ω	0Ω	1Ω	2.5meg +INF	0Ω	2.5meg +INF		
V5	EM34-35 6U8	TP	0Ω	12.2meg	2.7meg	†11K	†1meg	1Ω	0Ω	
V6	ECC83 12AX7	†INF ±1.48DK	10meg	0Ω	0Ω	0Ω	±480K	10meg	0Ω	1Ω
V7	EC92 6AB4	†470K	NC	1Ω	0Ω	NC	10meg	0Ω		
V8	EL95	1.7meg	200Ω	1Ω	0Ω	†210Ω	†1300Ω	1.7meg		
V9	EL95	1.7meg	200Ω	0Ω	1Ω	†215Ω	†1300Ω	1.7meg		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM OUTPUT OF MI
= MEASURED IN "AM" POSITION
■ MEASURED IN "PU" POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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419-5

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	460KC (400~ Mod.)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4 A5	Adjust for maximum output.
2.	"	High side to AM antenna receptacle. Low side to chassis.	"	BC "FA" Off	"	"	A6	Adjust for MINIMUM output.
3.	"	"	1600KC	"	1600KC	"	A7	Adjust for maximum output.
4.	"	"	600KC	"	600KC	"	A8	Adjust for maximum output. Repeat steps 3 and 4.
5.	"	"	1400KC	"	1400KC	"	A9	Adjust for maximum output.
6.	"	"	600KC	"	600KC	"	A10	"
7.	"	"	1000KC	"	1000KC	"	A11	"
8.	200mmf	"	8.0MC	SWI	8.0MC	"	A12, A13	"
9.	"	"	3.5MC	"	3.5MC	"	A14, A15	Adjust for maximum output. Repeat steps 8 and 9.
10.	"	"	18MC	SWII	18MC	"	A16, A17	Adjust for maximum output.
11.	"	"	8.5MC	"	8.5MC	"	A18, A19	Adjust for maximum output. Repeat steps 10 and 11.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	200mmf	High side to pin 2 (grid) of EBF89 (V3). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A20	Adjust for maximum deflection.
13.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A21	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	High side to pin 7 (grid) of 6AQ8/ECC85 (V1). Low side to chassis.	"	"	"	DC probe to point Ⓐ. Common to chassis.	A22, A23 A24, A25 A26, A27	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
12.	200mmf	High side to pin 2 (grid) of EBF89 (V3). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A20	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
13.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A21	Reconnect stabilizing capacitor C3. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A20 for maximum amplitude and straightness of crossover lines.
14.	"	High side to pin 7 (grid) of 6AQ8/ECC85 (V1). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓐ. Low side to chassis.	A22, A23, A24, A25, A26, A27	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. Reconnect C3.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
15.	270Ω Carbon Resistor	Across FM antenna terminals.	105MC (Unmod.)	FM	105MC	DC probe to point Ⓐ Common to chassis.	A28, A29	Adjust for maximum deflection.
16.	"	"	90MC	"	90MC	"	A30, A31	Adjust for maximum deflection. Repeat steps 15 and 16.

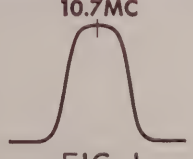


FIG. 1

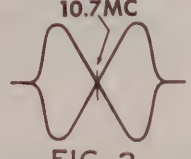
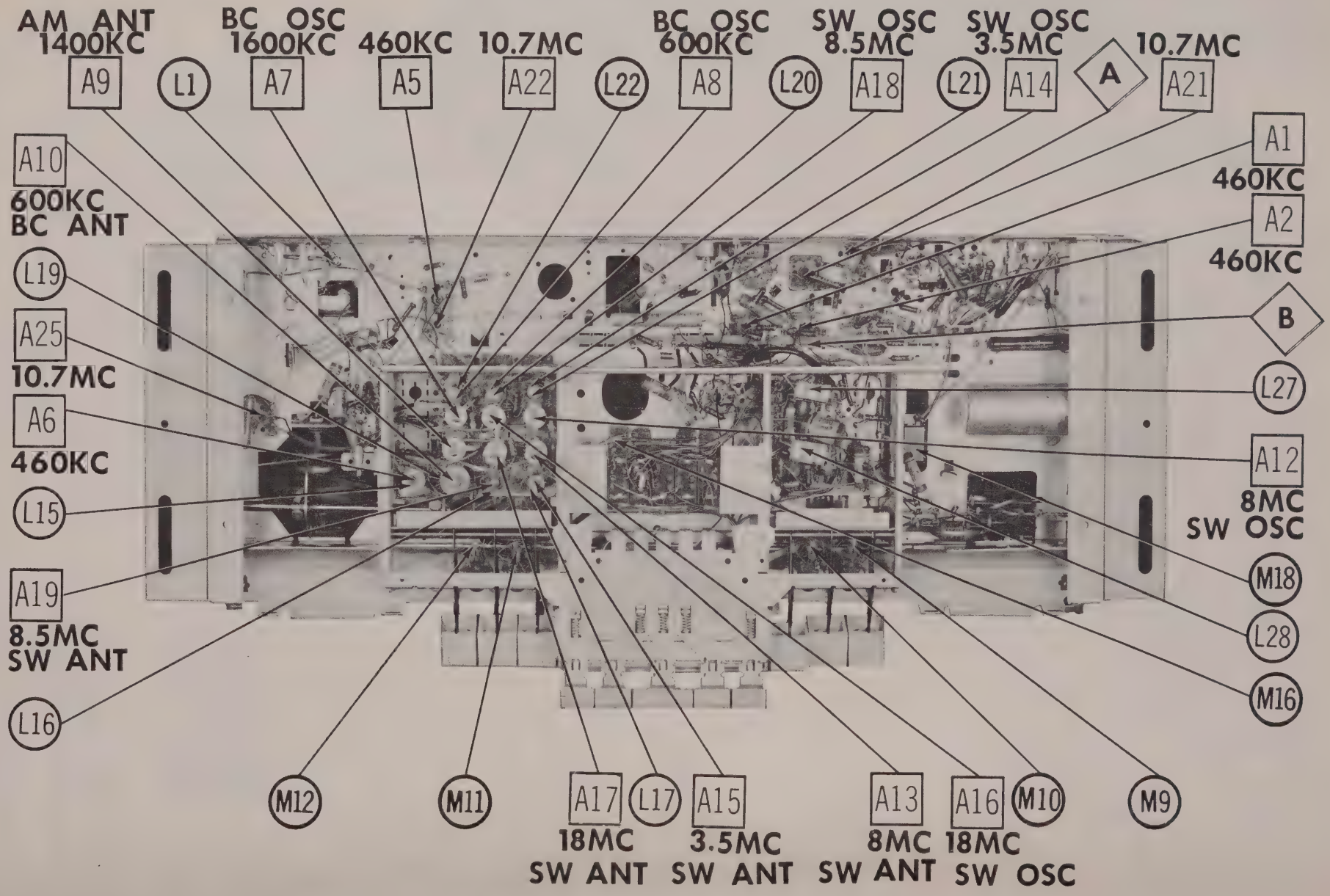
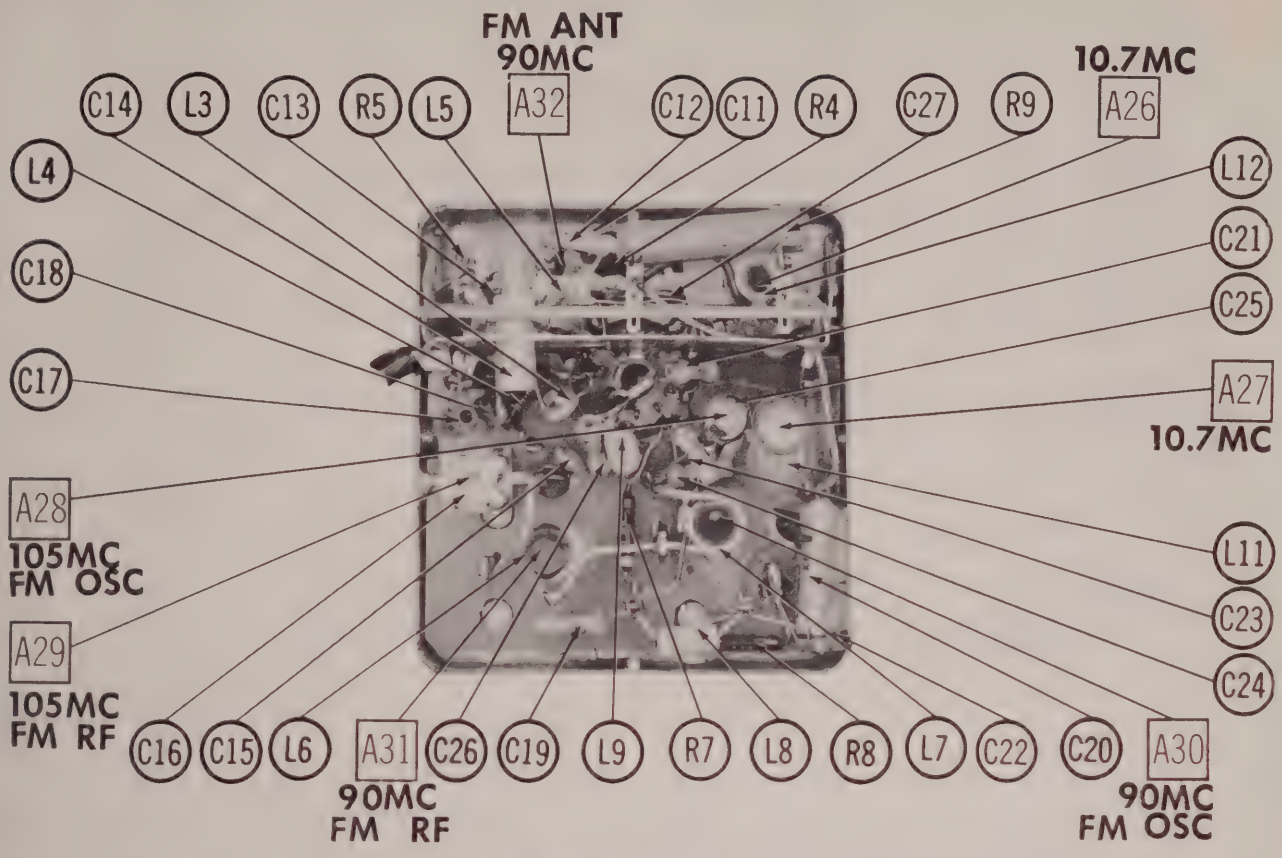


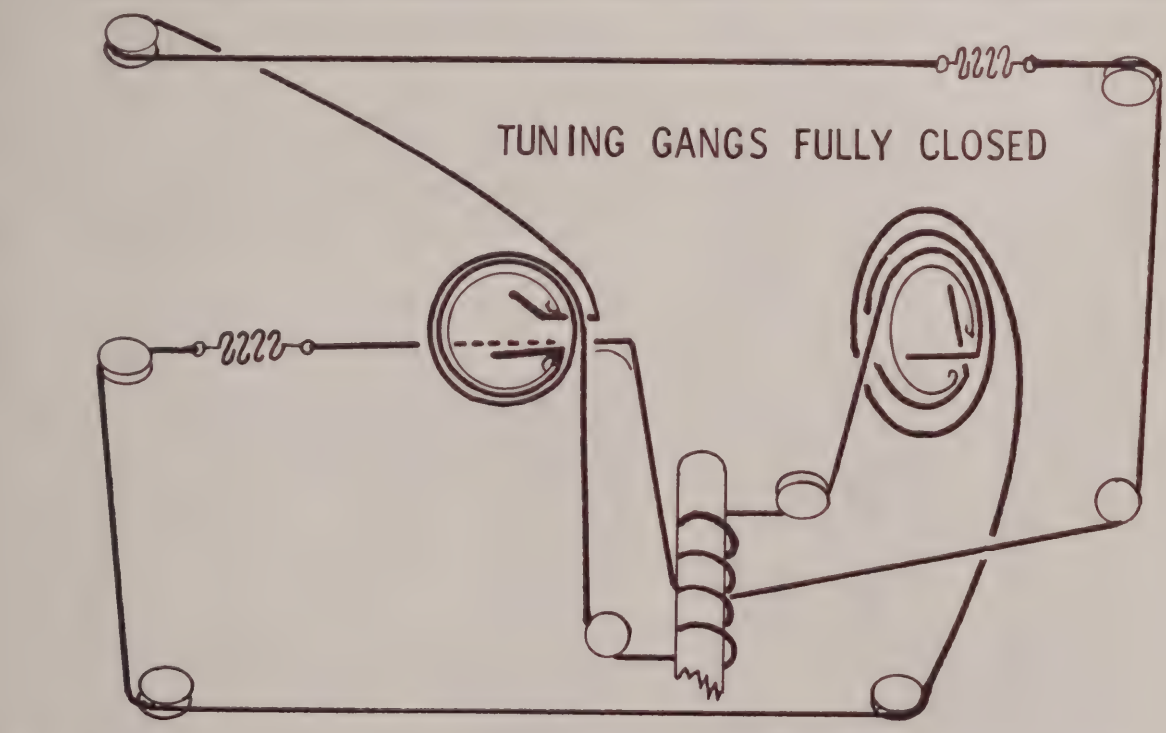
FIG. 2



CHASSIS BOTTOM VIEW - ALIGN, INDUCTOR, & MISC IDENT



FM RF SUB CHASSIS



DIAL CORD STRINGING

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp.-1st FM IF Amp. - FM Converter	ECC85/6AQ8 ①
V2	2nd FM IF Amp. -AM Mixer-AM Oscillator	ECH81/6AJ8 ①
V3	3rd FM-1st AM IF Amp. - AM Det. - AVC	EBF89

ITEM No.	USE	TYPE
V4	Ratio Detector	EAA91/6AL5 ①
V5	Tuning Indicator	EM34-35/6CD7 ①
V6	Phono Preamp.-AF Amp.	ECC83/12AX7 ①
V7	Phase Inverter	EC92/6AB4 ①
V8	Output	EL95
V9	Output	EL95

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385						S-275	R2582 *
B	50	385						MT-4550	
C2	4	385		PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C3	10	80		PRS150V10	BBR10-90	TC42	TD-10-150	MT-1510	TVA-1406
C4	50	15		PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C5	20	40NP	0820-150	NP-PRS300V 20	BR4015 † BR4015 †	TC48 † TC48 †	TD-40-150 TD-40-150†	MT-1540 MT-1540 †	R2643 *

† Connect Negative Leads together. * Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	35								
C7	35								
C8	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C9	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C10	18			SI 18	D6-180	LT6Q18	UC-5418	5GA-Q18	
C11	35								
C12	150			SI 150	D6-151	LT6T15	UC-5315	5GA-T15	
C13	200			1468-0002	DD-201	5W5T2	MC237	1FM-32	
C14	. 5-4								
C15	15			BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C16	1. 7-10								
C17	4700			SI 4700	D6-472	LT6D47	UC-5247	5GA-D47	
C18	140								
C19	30			SI 30	NPO-SI 30	TCZ-30		5GA-Q3	
C20	600			1468-0006	DD-601	1W5T6			
C21	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C22	2000			1467-002	DD-202	1W5D2	MCB-456	1FM-22	
C23	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C24	18			SI 18	D6-180	LT6Q18	UC-5418	5GA-Q18	
C25	. 5-4								
C26	30			SI 30	D6-300	TCZ-30		5GA-Q3	
C27	1000			BPD-001	DD-102	L10D1	DC521	5HK-D1	
C28	47			1468-000047	DD-470	5W5Q47		1FM-447	
C29	270			1468-00027	DD-271	5W5T27		1FM-327	
C30	90			1468-000091	DD-910	5W5Q91		1FM-491	
C31	3-30								
C32	33			1468-000033	DD-330	5W5Q33			
C33	3-30								
C34	3-30								
C35	8200								

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C36	. 022	500		P688N-022		CUB6S22	GEM-6122	6TM-S22	
C37	. 022	125		P288N-022		CUB4S22	GEM-4122	2TM-S22	
C38	47			1468-000047	DD-470	5W5Q47		1FM-447	
C39	150			SI 150	D6-151	LT6T15	UC-5315	5GA-T15	
C40	36			NPO-SI-36	TCZ-36	C10Q36U			
C41	3-30								
C42	4700			SI 4700	D6-472	LT6D47	UC-5247	5GA-D47	
C43	22			SI 22	D6-220	LT6Q22	UC-5422	5GA-Q22	
C44	3-30								
C45	480								
C46	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C47	3-30								
C48	8200								
C49	220			SI 220	DD-221	5W5T22		1FM-322	
C50	8200								
C51	. 0068	500		P688N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C52	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C53	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C54	4700								
C55	100			1468-0001	DD-101	5W5T1	MC-235	1FM-31	
C56	. 047	125		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C57	. 033	125		P288N-033		CUB6S33	GEM-4133	6TM-S33	
C58	1000			1468-001	DD-102	1W5D1	MC255	1FM-21	
C59	820			1468-00082	DD-821	1W5T82		1FM-382	
C60	680			1468-00068	DD-681	1W5T68		1FM-368	
C61	. 001	125		P288N-001	D6-102	CUB6D1	GEM-421	6TM-D1	
C62	. 033	125		P288N-033		CUB6S33	GEM-4133	6TM-S33	
C63	270			1468-00027	DD-271	5W5T27		1FM-327	
C64	. 022	500		P688N-022	D6-203	CUB6S22	GEM-6122	6TM-S22	
C65	. 022	125		P288N-022	D6-203	CUB4S22	GEM-4122	2TM-S22	
C66	390			1469-00039	MD-391	22R5T39		MS-339	10%
C67	330			1469-00033	MD-331	22R5T33		MS-333	10%
C68	470			1469-00047	MD-471	22R5T47		MS-347	10%
C69	100			1468-0001	DD-101	5W5T1	MC235	1FM-31	
C70	120			1469-00012	MD-121	22R5T12		MS-312	10%
C71	. 0022	125		P288N-0022	D6-222	CUB6D22	GEM-6222	6TM-D22	
C72	270			1468-00027	DD-271	5W5T27		1FM-327	
C73	. 01	150		P288N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C74	. 047	125		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C75	. 1	125		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C76	. 022	150		P288N-022	D6-203	CUB4S22	GEM-4122	2TM-S22	
C77	. 15	125		P288N-15		CUB2P15	GEM-2015	2TM-P15	
C78	. 015	125		P288N-015		CUB6S15	GEM-4115	4TM-S15	
C79	. 068	125		P288N-068		CUB4S68	GEM-4168	4TM-S68	
C80	. 01	125		P288N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C81	220			1468-00022	DD-221	5W5T22		1FM-322	
C82	. 01	500		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C83	. 001	125		P288N-001	D6-102	CUB6D1	GEM-421	6TM-D1	
C84	. 022	250		P488N-022	D6-203	CUB4S22	GEM-4122	4TM-S22	
C85	. 00047	500		P688N-0005	D6-471				
C86	. 00082	1000			DD-821				

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2meg	1/2	7801-187					Volume, Tap ② 500K &
R2	3000Ω	1/2	5175					Bias 1. 5meg
R3A	100K	1/2	7806-183					Bass
B	5meg	1/2						Bass
C	5meg	1/2						Treble
D	1000Ω	1/2						Tone
E	1000Ω	1/2						Tone

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R4	15K			
R5	470K			
R6	6800Ω	1		
R7	1800Ω			
R8	1meg			
R9	12K	1		
R10	1000Ω			
R11	33Ω			
R12	820K			
R13	33K	1		
R14	120Ω			
R15	33K			
R16	68Ω			
R17	330Ω			
R18	33K	1		
R19	47K			
R20	470K			
R21	1000Ω			
R22	56K	1		
R23	100K			
R24	270Ω			
R25	270Ω			
R26	6800Ω			
R27	6800Ω			
R28	330K			
R29	150K			
R30	68K			
R31	1.8meg			
R32	2.2meg			
R33	22meg			
R34	820K			
R35	2.2meg			

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R36	1meg			
R37	2.7meg			
R38	100K			
R39	820K			
R40	47K			
R41	10meg			
R42	470K			
R43	330K			
R44	180K			
R45	4.7meg			
R46	220K			
R47	15K			
R48	22K			
R49	2200Ω			
R50	330Ω			
R51	470Ω			
R52	180Ω			
R53	3300Ω			
R54	10meg			
R55	470K			
R56	10K			
R57	10meg			
R58	470K			
R59	1000Ω			
R60	1.2meg			
R61	470K			
R62	47K			
R63	1.2meg			
R64	22K			
R65	47K			
R66	200Ω 2%	(WW)		
R67	1300Ω 2%	4(WW)		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Grundig Majestic PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	9238-038					
L2	FM Ant. Trans	HFBV1974/I					
L3	RF Choke	HFBV1976/I	19-1001	BC-562	4604		1.5 Microhenry
L4	RF Choke	HFBV1956/I					Wound on 100Ω Resistor
L5	RF Choke	HFBV1976/I					2.85 Microhenries
L6	FM RF Coil	9208-005					
L7	FM Osc. Coil	9208-065					
L8	RF Choke	HFBV1975/I	19-1001	BC-562	4604		1.5 Microhenry
L9	Cathode Choke	HFBV1950/I	19-1000	BC-561	4602		1.25 Microhenry
L10	Fil. Choke	9238-012	19-1001	BC-562	4604		1.5 Microhenry
L11	1st FM IF Pri.	HFBV1977/I					
L12	1st FM IF Sec.	9208-064					
L13	RF Choke	9238-022	19-1001	BC-562	4604		1.5 Microhenry
L14	2nd FM IF	7206-208					
L15	IF Trap Coil	9208-055					
L16	SW Ant. Trans.	9232-011					
L17	SW Ant. Trans.	9231-016					
L18	Loop Stick	9233-007					
L19	BC Ant. Trans.	9208-059					
L20	SW Osc. Coil	9232-008					
L21	SW Osc. Coil	9231-017					
L22	BC Osc. Coil	HFBV1681					
L23A	3rd FM IF	7207-309					
B	1st AM IF						
L24	Ratio Det.	7206-207					

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA Grundig Majestic PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L25	2nd AM IF	7206-108					
L26	3rd AM IF	7206-105					
L27	Tone Choke	9217-006					
L28	Tone Choke	9217-016					
L29	Speaker Choke	HFBV2048/I					
L30	Speaker Choke	HFBV1700	19-1001	BC-562	4604		1.4 Microhenry
L31	Speaker Choke	HFBV1700	19-1001	BC-562	4604		1.4 Microhenry
L32	Speaker Choke	HFBV1700	19-1001	BC-562	4604		1.4 Microhenry
L33	Speaker Choke	HFBV1700	19-1001	BC-562	4604		1.4 Microhenry
L34	Line Choke	9227-005					
L35	Line Choke	9227-004					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Tap ② 117V ③ .54A	220V ③ .080A	6.3V Tap ④ 5V (3.1A Total)	9084-029						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6700Ω CT	3-4Ω	9060-024							
	Turns Ratio	SEC.2								
	10	: 1								

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Grundig Majestic PART No.	QUAM PART No.	NOTES
SP1	8" X 12"	PM	3-4Ω	7046-002		
SP2	5" X 7"	PM	3-4Ω	0459-21	57A21	
SP3	5" X 7"	PM	3-4Ω	0459-21	57A21	
SP4	3" X 3"	Electrostatic		7082-002		
SP5	3" X 3"	Electrostatic		7082-002		

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Grundig Majestic PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.084A	B250C100		61-4037	D-64 ①	① Silicon

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Grundig Majestic PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	Slo-Blo	0.7A 110V	0.7A ①	9625-057				
M3	Slo-Blo	0.5A 110V	0.5A	101				

① .4A Used when receiver is operated from 220VAC source

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Grundig Majestic PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M4						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Grundig Majestic PART No.	JENSEN PART No.	WALCO PART No.	
M5		♦ RX552LPD or ♦ RX552D	† W-93TPS or †♦W-93DS or ♦ W-93TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M6	Lamp		7V 0.3A
M7	Lamp		7V 0.3A
M8	Lamp		6V 0.1A
M9	Lamp		6V 0.1A
M10	Lamp		6V 0.1A
M11	Lamp		6V 0.1A
M12	Lamp		6V 0.1A
M13	Tuner	7435-012	FM
M14	Tuning Cap.	1006-022	AM (Ant. 13-544mmf, Osc. 18-482mmf)
M15	Tuning Cap.	9653-601	FM (Ant. 4.5-14.85mmf, Osc. 4.5-20mmf)
M16	Switch	7612-018	Contact Slide Device for Tone Control Keyboard
M17	Switch	1072-065	Ferrite Antenna
M18	Switch	7404-548	Power On-Off, Toggle Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	9616-532	Right Hand, Large, Lower Part
Knob	9616-534	Left Hand, Large, Lower Part
Knob	9616-536	Small, Top Part
Press Button	7404-501	Six Used
Press Button	7410-020	Block, With Coil Set
Pushbutton Device	7612-016	Tone Control Keyboard
Cabinet	2038-111	
Pointer	1035-095	AM
Pointer	1032-073	FM
Dial Scale	2038-115	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder
with CIRCUITRACE*

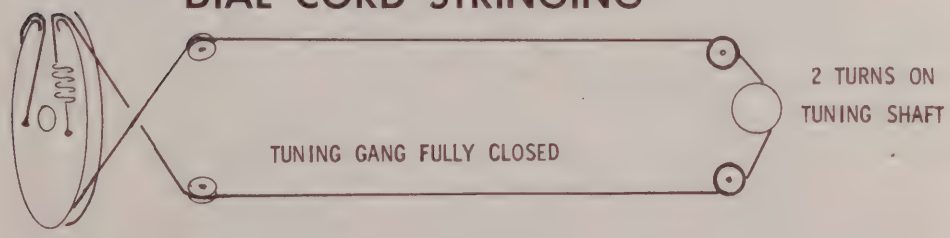
HARMAN-KARDON MODEL FA-10 "Sonata"

HARMAN-KARDON MODEL
FA-10 "Sonata"

HARMAN-KARDON MODEL
FA-10 "Sonata"

TRADE NAME	Harman-Kardon Model FA-10 "Sonata"
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, Long Island, N.Y.
TYPE SET	AC Operated FM Receiver
TUBES	Eleven
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .75 Amp. @ 117 Volts AC (75 Watts)
TUNING RANGE-FREQ. MOD.	88-108MC

DIAL CORD STRINGING



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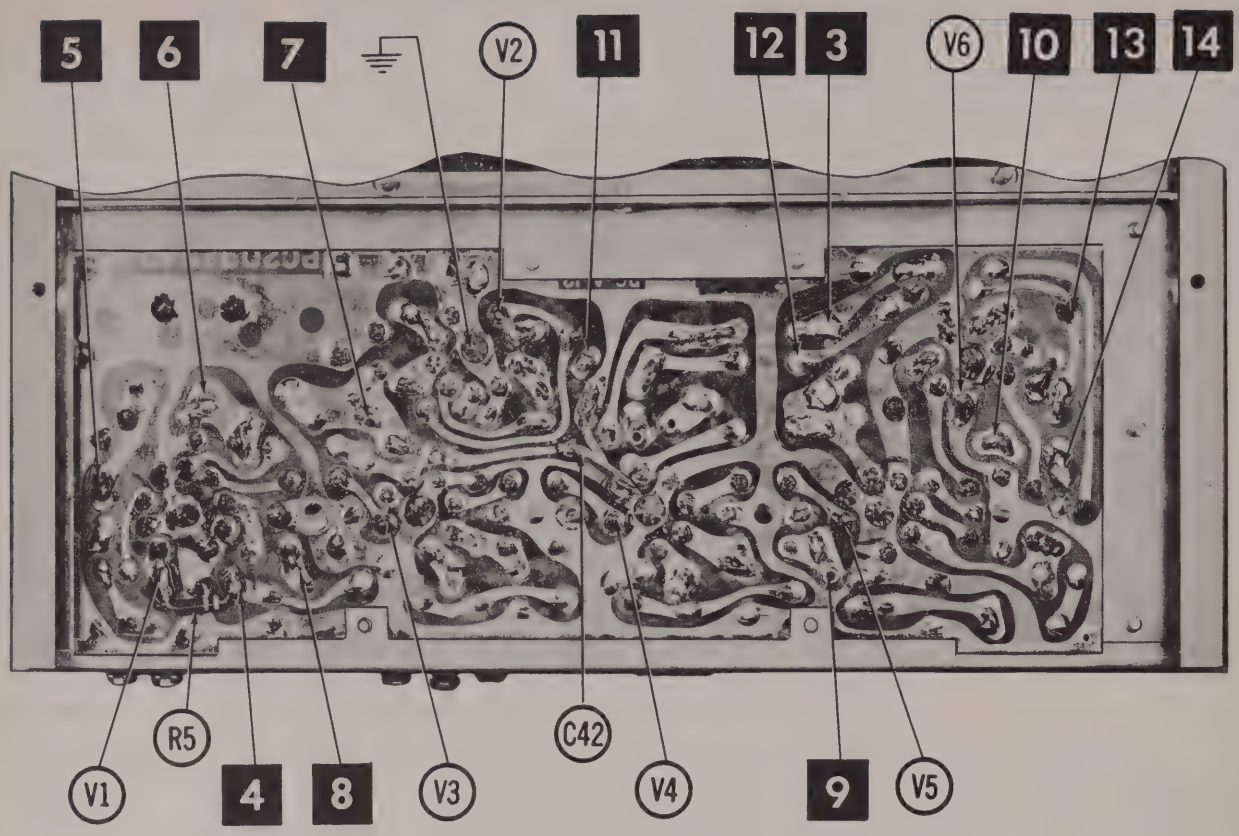
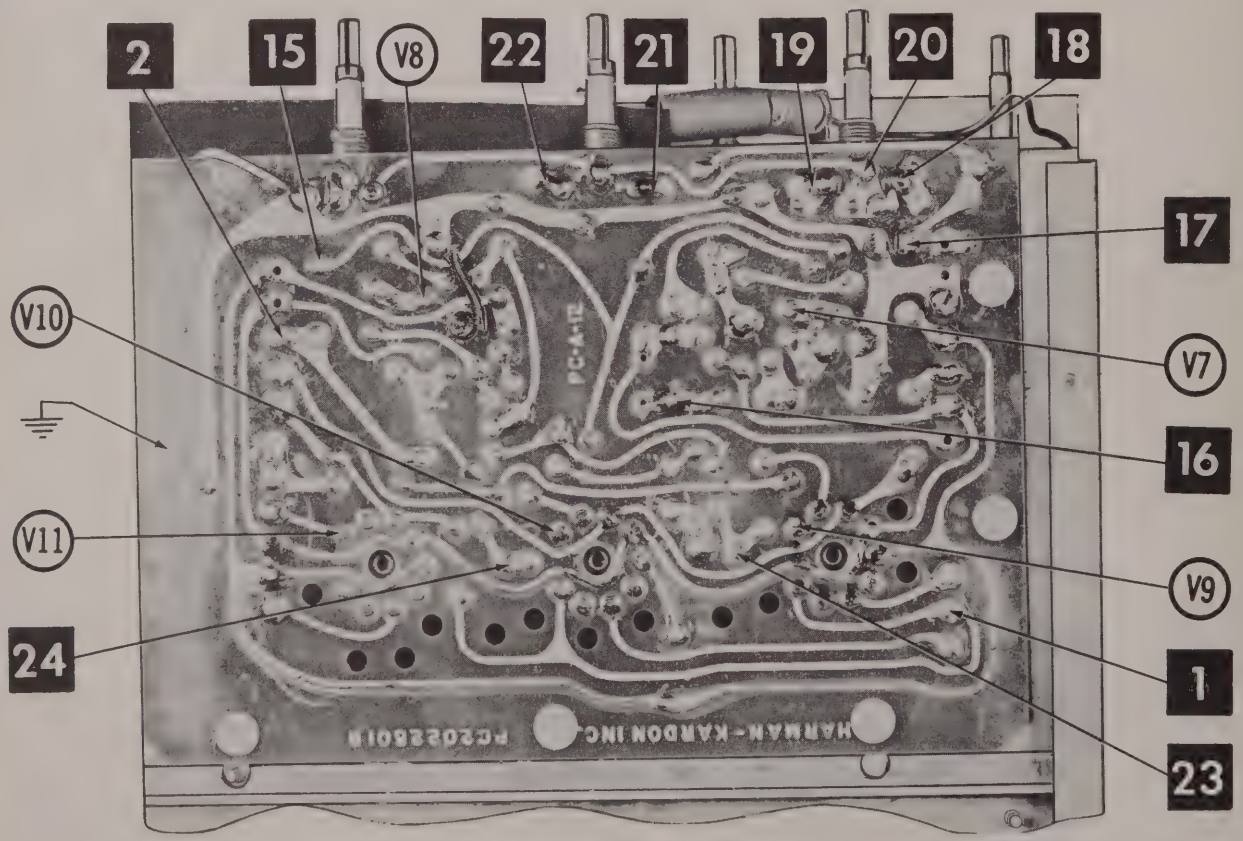
SET 419 FOLDER 6



A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

RF - IF
PRINTED BOARD

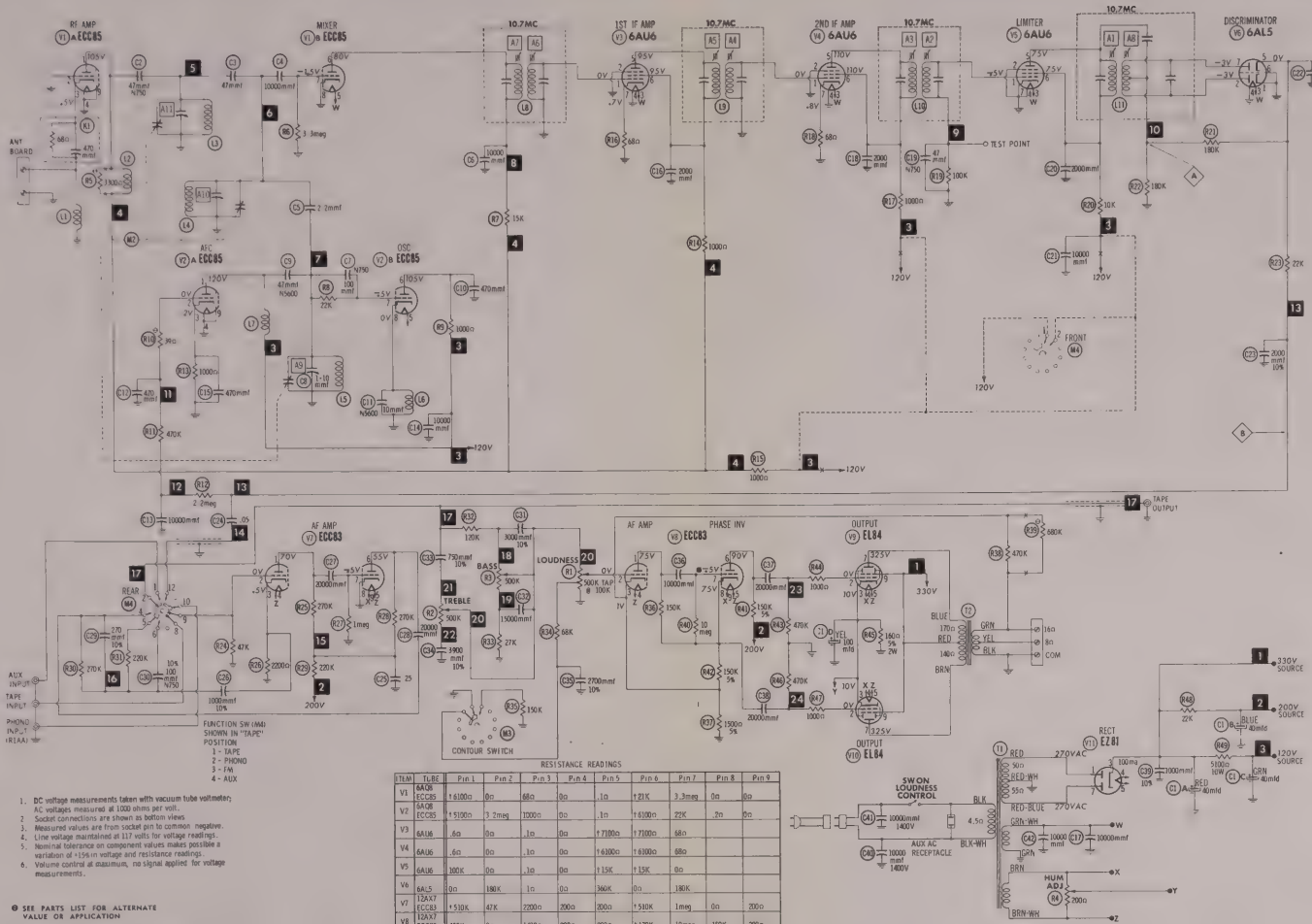
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

AUDIO - POWER
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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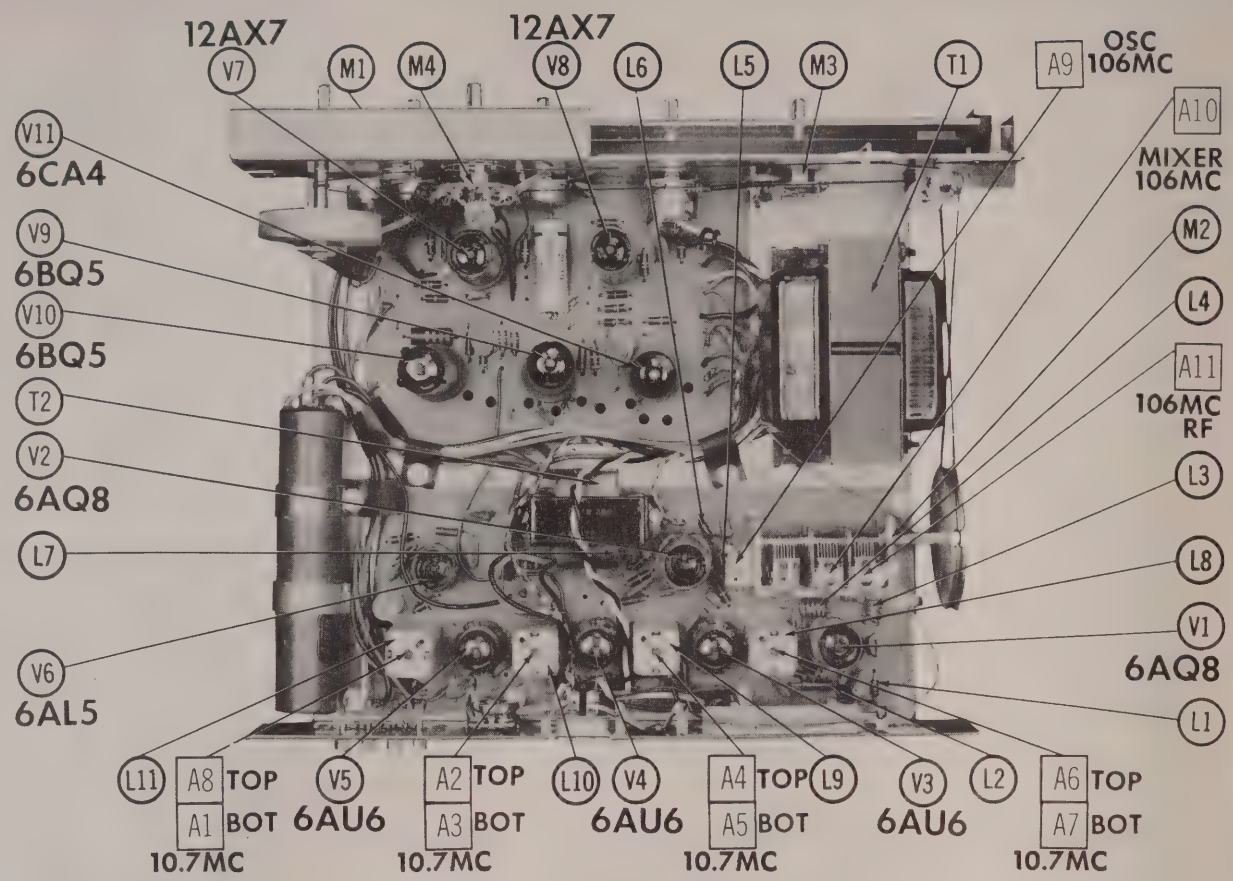
RESISTANCE READINGS

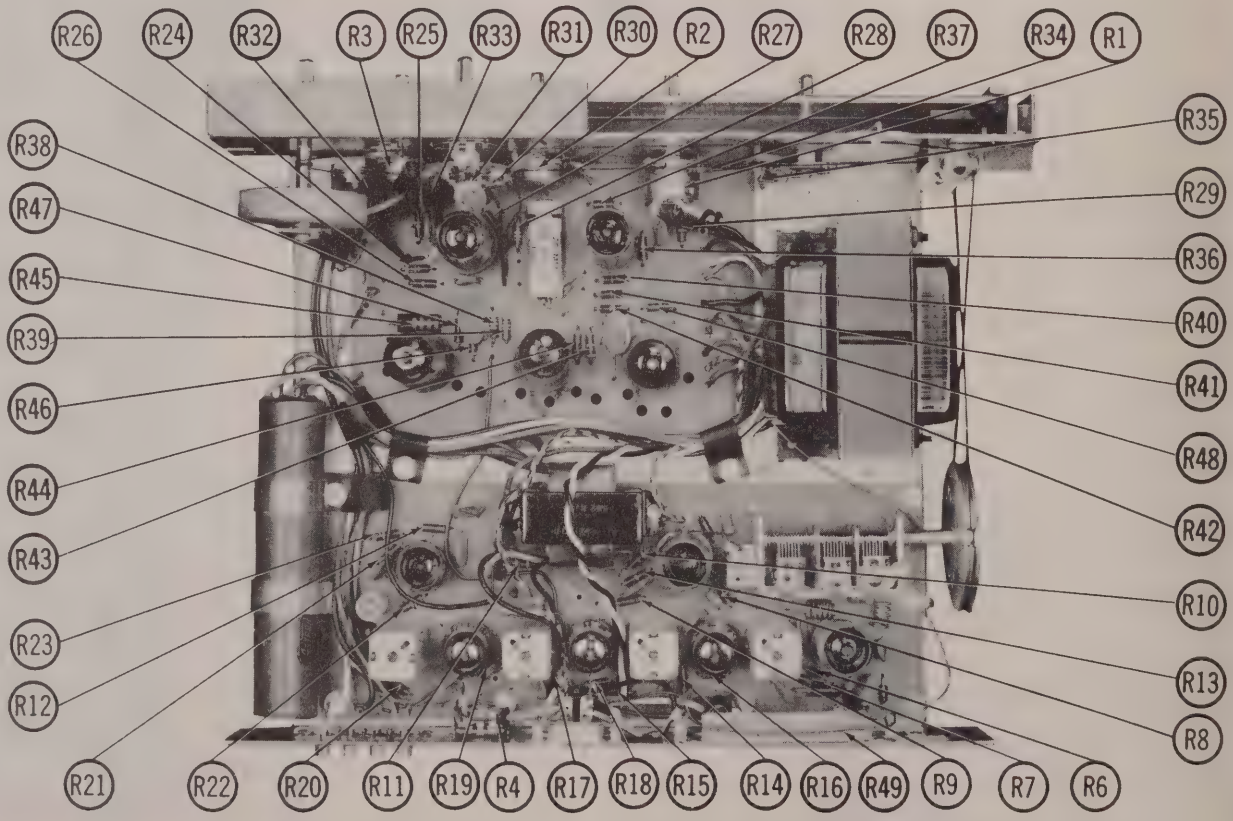
TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1 6AQ8 ECC85	†6100Ω	0Ω	68Ω	0Ω	.1Ω	†21K	3.3meg	0Ω	0Ω
V2 6AQ8 ECC85	†5100Ω	3.2meg	1000Ω	0Ω	.1Ω	†6100Ω	22K	.2Ω	0Ω
V3 6AU6	.6Ω	0Ω	.1Ω	0Ω	†7100Ω	†7100Ω	68Ω		
V4 6AU6	.6Ω	0Ω	.1Ω	0Ω	†6300Ω	†6300Ω	68Ω		
V5 6AU6	100K	0Ω	.1Ω	0Ω	†15K	†15K	0Ω		
V6 6AL5	0Ω	180K	.1Ω	0Ω	360K	0Ω	180K		
V7 12AX7 ECC83	†510K	47K	2200Ω	200Ω	200Ω	†510K	1meg	0Ω	200Ω
V8 12AX7 ECC83	300K	0Ω	1400Ω	200Ω	200Ω	†170K	10meg	150K	200Ω
V9 6BQ5 EL84	470K	470K	160Ω	200Ω	200Ω	NC	†170Ω	NC	†0Ω
V10 6BQ5 EL84	470K	470K	160Ω	200Ω	200Ω	NC	†140Ω	NC	†0Ω
V11 6CA4 EZ81	56Ω	NC	¶	200Ω	200Ω	NC	48Ω	NC	NC

† MEASURED FROM PIN 3 OF V11.
¶ MEASURED FROM PIN 8 OF V8
NC NO CONNECTION.

419-6



CHASSIS TOP VIEW - ALIGN, INDUCTOR, MISC & TUBE IDENT



CHASSIS TOP VIEW - RESISTOR IDENT

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	RF Amp.-Mixer	ECC85/6AQ8 ①
V2	FM Osc.-AFC	ECC85/6AQ8 ①
V3	1st. IF Amp.	6AU6
V4	2nd. IF Amp.	6AU6
V5	Limiter	6AU6
V6	Discriminator	6AL5

ITEM No.	USE	TYPE
V7	AF Amplifier	ECC83/12AX7 ①
V8	AF Amp.-Phase Inv.	ECC83/12AX7 ①
V9	Output	EL84/6BQ5 ①
V10	Output	EL84/6BQ5 ①
V11	Rectifier	EZ81/6CA4 ①

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	400	JE2252599					T-170	R2700 *
B	40	350						MTH-2510	
C	40	200							
D	100	25							

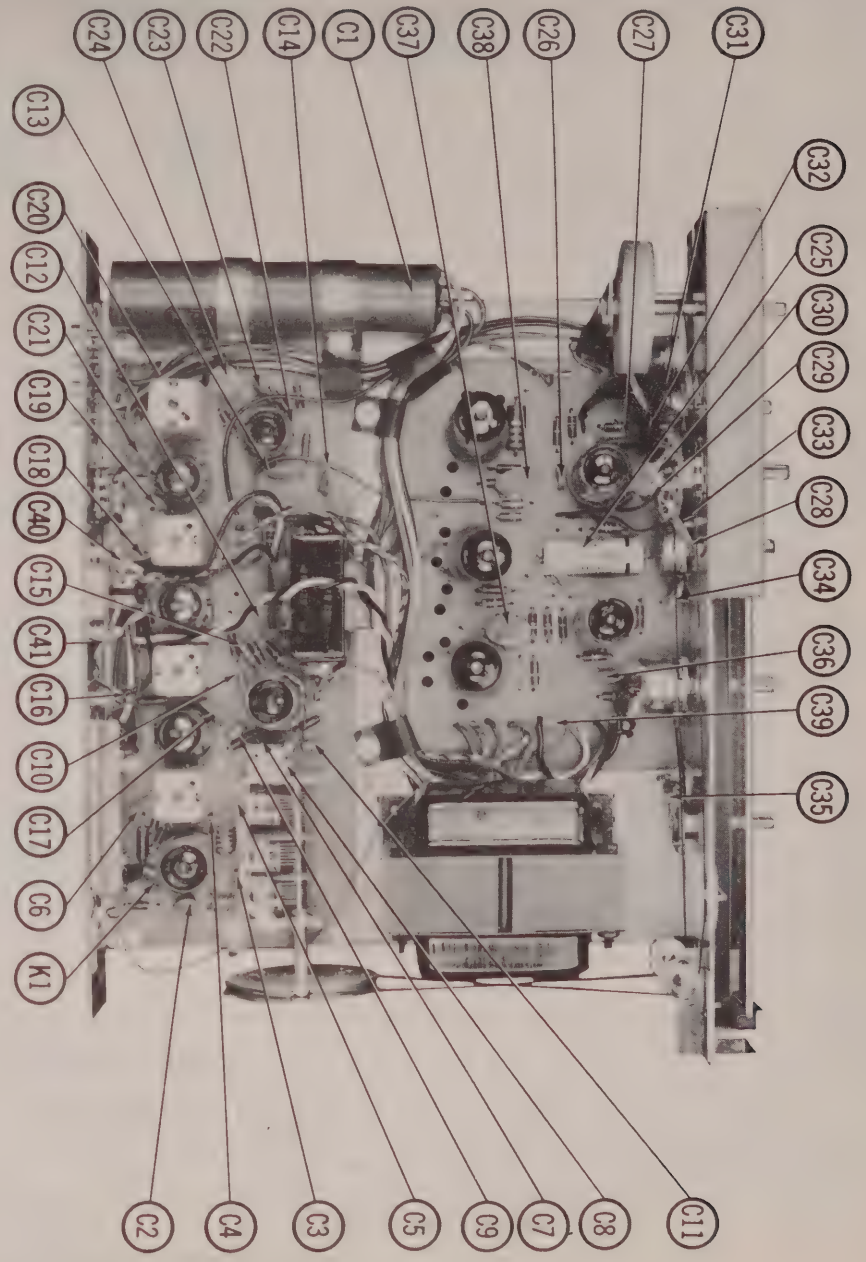
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	47			N750-DI 47	DTN-47	C10Q47U	NT-5447	5TCU-Q47	N750
C3	.47								
C4	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C5	2.2			NPO-SI 2.2	TCZ-2R2	CTA6V22C		5TCCB-V22	
C6	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C7	100			N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1	N750
C8	1-10								
C9	47								N5600
C10	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C11	10								N5600
C12	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C13	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C14	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C15	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C16	2000			BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C17	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C18	2000			BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C19	47			N750-DI 47	DTN-47	C10Q47U	NT-5447	5TCU-Q47	N750
C20	2000			BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C21	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C22	100			N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1	N750
C23	2000								10%
C24	.05	200		P288N-05	DF-503	CUB285	ACE615	2TM-S5	
C25	.25	200		P288N-25		CUB2P25	GEM-2025	2TM-P25	
C26	1000								10%
C27	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C28	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C29	270				MD-271	L10T27		5TCC-T27	10%
C30	100			N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1	N750 10%
C31	3000								10%
C32	15000			BPD-015	DD16-153	BYA10S15		5HK-S15	
C33	750								10%
C34	3900								10%
C35	2700								10%
C36	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C37	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C38	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C39	1000								10%
C40	10000	1400		DAC-27	DD16-103	HVE16S1		BL-S10	
C41	10000	1400		DAC-27	DD16-103	HVE16S1		BL-S10	
C42	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	

CHASSIS TOP VIEW CAP IDENTIFICATION



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RV2252609	BT-66	A47F3-500K	Q13-133X	UT-427	Loudness, Tap @ 100K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	500K	½	RV2252610	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	RV2252610	B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	200Ω	½	RVCOM2411	AB-2		B11-201	U1	Hum Adjustment
B	Shaft			AK-1		5K2	Not Req.	

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Harman-Kardon PART No.	NOTES
	OHMS	WATT		
R5	3300Ω			Note 1
R6	3.3meg			
R7	15K			
R8	22K			
R9	1000Ω			
R10	39Ω			Note 2
R11	470K			
R12	2.2meg			
R13	1000Ω			
R14	1000Ω			
R15	1000Ω			
R16	68Ω			
R17	1000Ω			
R18	68Ω			
R19	100K			
R20	10K			
R21	180K			
R22	180K			
R23	22K			
R24	47K			
R25	270K			
R26	2200Ω			
R27	1meg			

ITEM No.	RATING		Harman-Kardon PART No.	NOTES
	OHMS	WATT		
R28	270K			Note 1
R29	220K			
R30	270K			
R31	220K			
R32	120K			
R33	27K			
R34	68K			
R35	150K			
R36	150K			
R37	1500Ω 5%			
R38	470K			
R39	680K			
R40	10meg			
R41	150K 5%			
R42	150K 5%			
R43	470K			
R44	1000Ω			
R45	160Ω 5%	2		
R46	470K			
R47	1000Ω			
R48	22K			
R49	5100Ω	10		

Note 1. Not used in some versions.
Note 2. Some versions may use 100Ω in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		Harman-Kardon PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	GC28831			4584		.24 Microhenry
L2	RF Choke	GC481454					3.3 Microhenries
L3	RF Coil	GL781543					
L4	Mixer Coil	GL781543					
L5	Osc. Coil	GL1122007					
L6	Cathode Choke	GC24602	19-1000	BC-561	4602		1 Microhenry
L7	RF Choke	GC481554					3.3 Microhenries
L8	1st. IF Trans.	GT2092595	16-3490			1463-PC	
L9	2nd. IF Trans.	GT2092596	16-3490			1463-PC	
L10	3rd. IF Trans.	GT2092597	16-3490			1463-PC	
L11	Discriminator	GT2092598					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .75A	500VCT @ .100A	6.3V @ 3A	FT2252592						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5800Ω CT	16Ω tap @ 8Ω	FT2252629	Z1402	A-2901	AU-600	A-3823	26S46	S-55Z	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA
K1	Ant. Coupling	470mmf, 68Ω		

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M1	Lamp		#1847
M2	Tuning Cap.	JV2092541	3 Gang
M3	Switch	ER2252622	Contour, Rotary, Wafer Type
M4	Switch	ER2252593	Function, Rotary, Wafer Type
	Printed Board	PC2022501B	Audio-Power
	Printed Board	PC2092542A	RF-IF

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	P22783	6 Used
Cage	P2252601	
Pointer	P1712390	
Dial Glass	P2252617	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type) ..... Use BELDEN No. 8874

PHOTOFACT* Folder

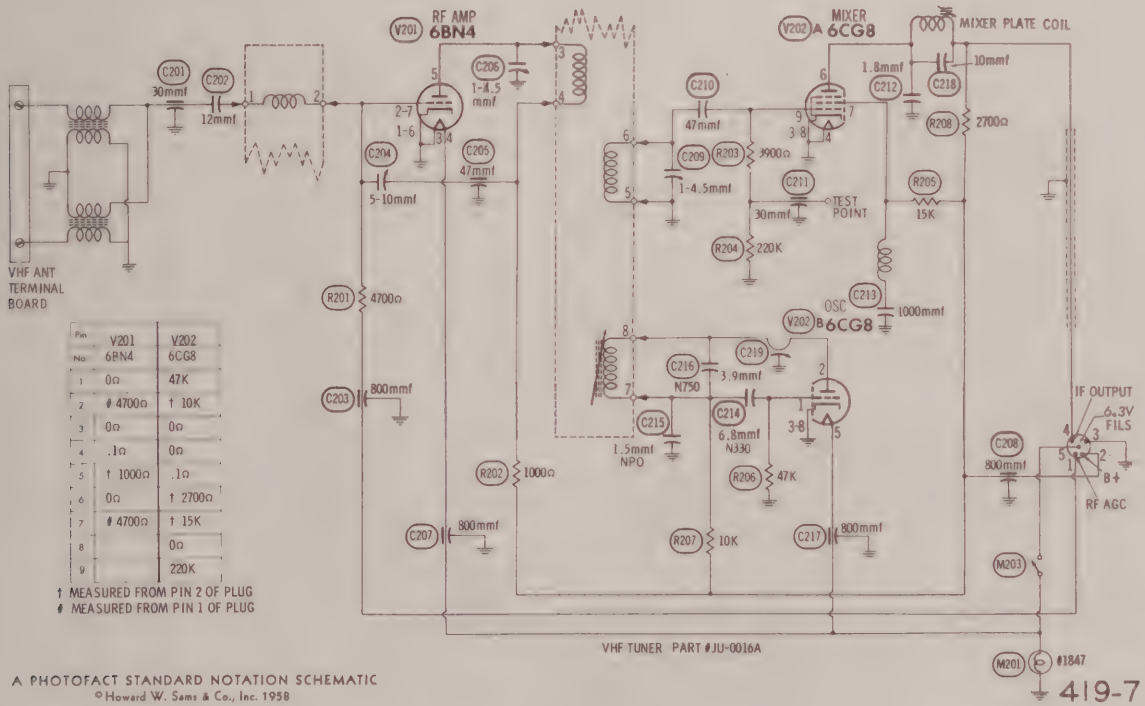
*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

KNIGHT MODEL KN-400 (92S407)

KNIGHT MODEL
KN-400 (92S407)

TRADE NAME	Knight Model KN-400 (92S407)
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois
TYPE SET	Externally Powered TV Sound Tuner
TUBES (Two)	Types 6BN4 RF Amplifier, 6CG8 Mixer-Oscillator
POWER SUPPLY	Externally Powered — TUNING RANGE VHF Channels 2 thru 13



Pin No	V201 6BN4	V202 6CG8
1	0Ω	47K
2	# 4700Ω	† 10K
3	0Ω	0Ω
4	.1Ω	0Ω
5	† 1000Ω	.1Ω
6	0Ω	† 2700Ω
7	# 4700Ω	† 15K
8		0Ω
9		220K

† MEASURED FROM PIN 2 OF PLUG
# MEASURED FROM PIN 1 OF PLUG

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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419-7

KNIGHT MODEL
KN-400 (92S407)

SET 419 FOLDER 7

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H556

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	6BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C201	30								
C202	12								
C203	800								
C204	5-10								
C205	47								
C206	1-4.5								
C207	800								
C208	800								
C209	1-4.5								
C210	47								
C211	30								
C212	1.8								
C213	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C214	6.8								N330
C215	1.5			NPO-S11.5	TCZ-1R5	CTA6V15C			NPO
C216	3.9								N750
C217	800								
C218	10			DI-10	DD-100	L10Q1	UC-541	5GA-Q1	
C219									

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	KNIGHT PART No.	NOTES
R201	4700Ω			
R202	1000Ω			
R203	3900Ω			
R204	220K			

ITEM No.	RATING OHMS	RATING WATT	KNIGHT PART No.	NOTES
R205	15K			
R206	47K			
R207	10K			
R208	2700Ω			

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M201	Lamp		#1847
M202	Tuner	JU-0016A	
M203	Switch		Off-On, Slide Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

ALIGNMENT INSTRUCTIONS

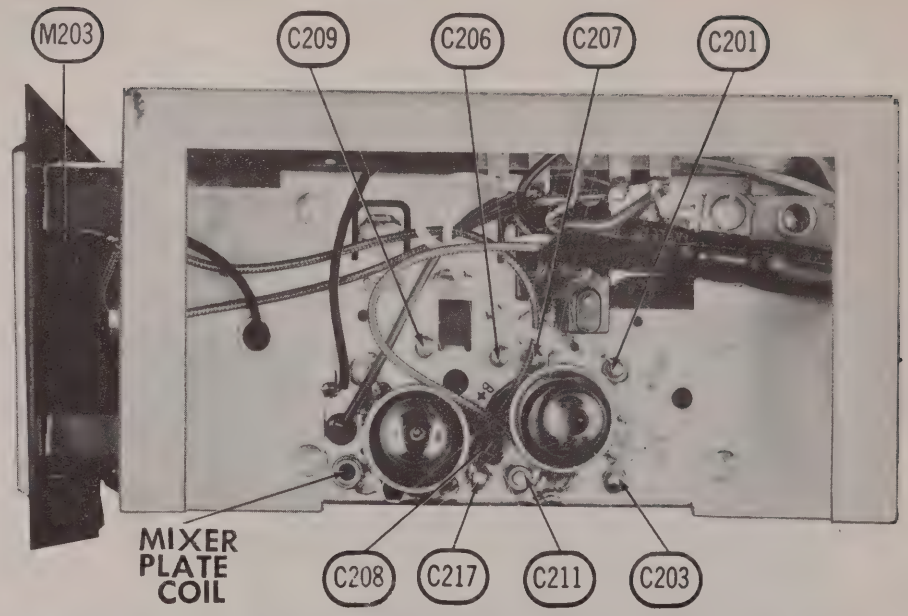
OSCILLATOR ALIGNMENT

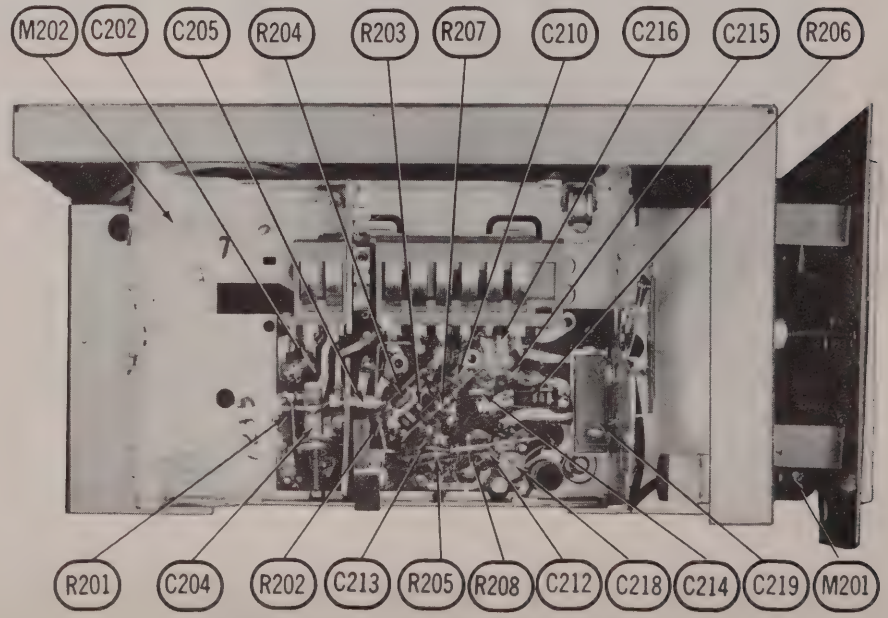
Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, as the Channel Selector is rotated. Adjust for best sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

CHASSIS—TOP VIEW



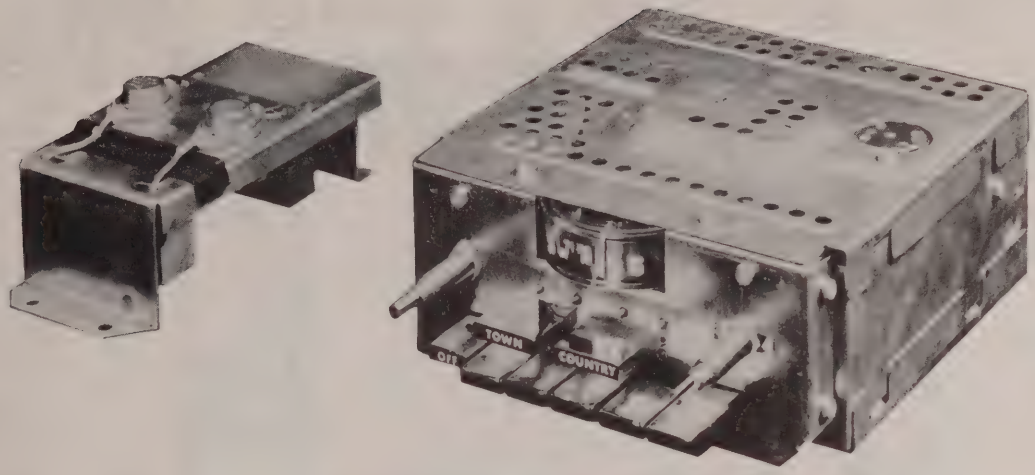


CHASSIS—BOTTOM VIEW

PHOTOFACT* Folder
*TRADE MARK

LINCOLN MODEL
85BH (FFC-18805-C, FFC-18805-D)

LINCOLN MODEL
85BH (FFC-18805-C, FFC-18805-D)



TRADE NAME	Lincoln Model 85BH (FFC-18805-C, FFC-18805-D) for 1958 Lincoln Automobiles
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore 4, Maryland
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output
TUBES (Five)	Types 12CX6 RF Amplifier, 12AD6 Converter, 12CN5 IF Amplifier, 12J8 Det.-AVC-Driver, 12U7 AF Amp.-Trigger
POWER SUPPLY	12 Volt Storage Battery
RATING	1.2 Amp. @ 12.6 Volts DC (1.8 Amp. when Seeking)
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at minimum. Output of signal generator should be no higher than necessary to obtain an indication. Use an insulated alignment screwdriver for adjusting. Set tone control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to Pin 7 (grid) of 12AD6 (V2). Low side to chassis.	262.5KC (400~ Mod.)	High End Stop.	DC Probe to high side of RIB. Common to Pin 7 of V4.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Fig. 1	Thru dummy to antenna receptacle.	1605KC	"	"	A5, A6, A7	" Repeat Steps 1 and 2.
3.	With radio installed in car and antenna fully extended, tune in a weak station near 1600KC and adjust A7 for maximum output.						
	Step 4 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9, A10) out of coils but not out of coil forms. Repeat Step 2.						
4.	Fig. 1	Thru dummy to antenna receptacle.	1000KC	Carriage 1/2" from High End Stop.	"	A8, A9, A10	Adjust for maximum deflection. Repeat Steps 2 and 4.
5.	Fig. 1	Thru dummy to antenna receptacle.	1000KC @ 3 microvolts (400~ Mod.)	Tune to 1000KC signal.	Output meter Across voice coil	R4	Adjust for 1.75 volts (approximately 1 watt).
6.	"	"	1000KC @ 250 microvolts		"	R3	Turn R3 fully counterclockwise. Press "Town" button. Turn R3 slowly until tuner stops seeking.
	Adjust generator for 125 microvolts. Press "Town" button. Tuner should NOT stop seeking. If necessary repeat Steps 5 and 6.						

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull out button, then press in firmly.
3. Repeat for remaining buttons.

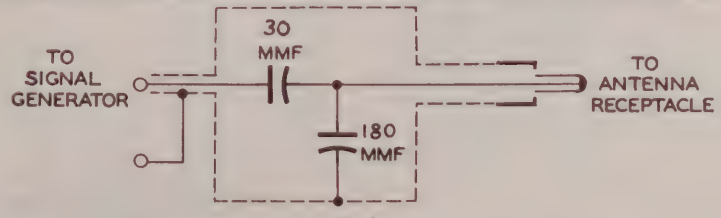


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12CX6	
V2	Converter	12AD6	
V3	IF Amplifier	12CN5	
V4	Det. -AVC-Driver	12J8	
V5	AF Amp. -Trigger	12U7	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N399	Output	CBS-2N399	2N301		2N350	
X2	2N399	Output	CBS-2N399	2N301		2N350	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	250	16	220108-7	AFH3-00-80		PWP200.3			R2669*
B	250	16				TT25X50			
C	50	16							

* Non-Catalog Item

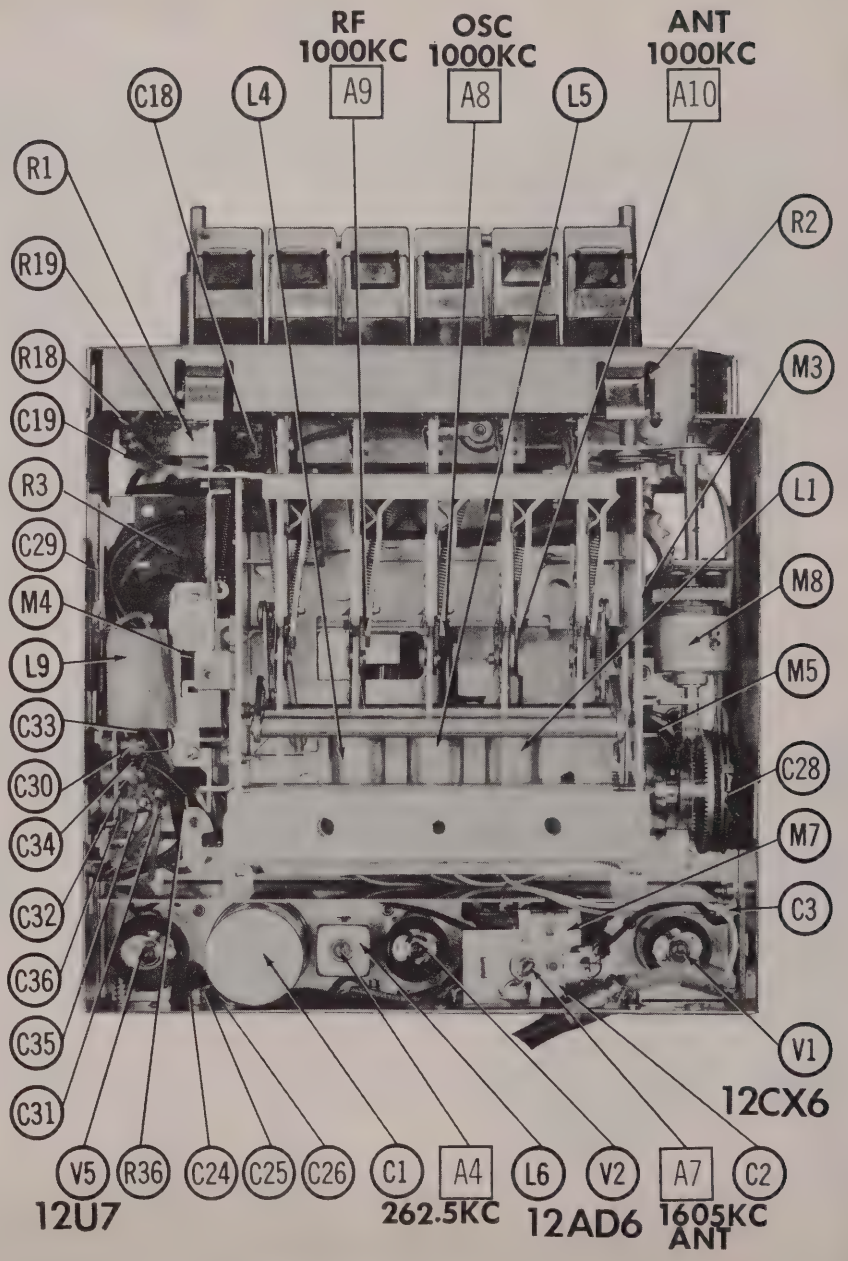
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	140-680		219083-2						
C3	220		2090058Q-221M	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C4	.1		220212-14						10%
C5	50000		220095-45	BPD-05	DF-503			5HK-S5	
C6	70-470		2090572-1						
C7	100		2090058Q-101M						N3300
C8	50000		220095-45	BPD-05	DF-503			5HK-S5	
C9	100		2090058Q-101M						N3300
C10	220-380		2090572-2						
C11	120		2090058J-121K						N750 10%
C12	390	300	220346-509	1469-00039	MD-391	5RST39		MS-339	10%
C13	1.2		220212-13						5%
C14	.5	100		P288N-5		CUB2P5	GEM-205	2TM-P5	Note 1
C15	100		2090058Q-101M						N3300
C16	100		2090058Q-101M						N3300
C17	2200		2090058R-222K						10%
C18	1800								10% Note 2
C19	1000		220095-43						10%
C20	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	Note 3
C21	5000		220095-44	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C22	1000		2090546-1	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	Note 4
C23	50000		220095-45	BPD-05	DF-503			5HK-S5	
C24	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C25	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C26	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C27	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C28	10000		220095-41	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C29	140		220267-11						
C30	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C31	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C32	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C33	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C34	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C35	1000		2090546-1	EF-001	MFT-1000			503C-D1	
C36	1000		2090546-1	EF-001	MFT-1000			503C-D1	

Note 1. Some versions may use .25mfd in this application (Part #220352-12).
Note 2. Some versions may use 2200mmf in this application (Part #2090058R-222K).
Note 3. Some versions may use 330mmf in this application (Part #2090058S-331M).
Note 4. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Switch		2090276-1					Tone
B	2meg	½						Volume, Tap ⓐ 650K
R2	11.5Ω	2 (WW)	219679-3					Speaker Fader
R3	1meg	2 (WW)	2090560-1					Town Sensitivity, with 50K Stop
R4	1000Ω	2 (WW)	219555-15		39-1000		FL-1.5K	Sensitivity
R5	25Ω	2 (WW)	219555-12					Motor Speed
R6	300Ω	2 (WW)	219555-17					Transistor Bias, with 100Ω Stop

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		BENDIX PART No.	NOTES
	OHMS	WATT		
R7	100K		220551B-104M	
R8	22meg		220551B-226M	
R9	33meg		220551B-336M	
R10	150Ω		220551B-151M	
R11	33K		220551B-333M	
R12	680K		220551B-684M	
R13	100K		220551B-104M	Note 1
R14	10Ω		220551B-100K	
R15	2.2meg		220551B-225M	
R16	2.2meg		220551B-225M	
R17	18Ω 5%		220551B-180J	
R18	220K		220551B-224K	
R19	82K		220551B-823K	Note 2
R20	3.9meg		220551B-395K	
R21	470K		229551B-474M	
R22	47K		229551B-473K	
R23	220Ω		220551B-221M	
R24	4700Ω		220551B-472K	Note 3
R25	33meg		220551B-336M	
R26	10meg		220551B-106M	
R27	150K		220551B-154M	Note 4
R28	2200Ω		220551B-222M	
R29	120Ω	1	220551C-121K	
R30	10meg		220551B-106M	
R31	220Ω		220551B-221M	
R32	4.5Ω Cold		220629-1	
R33	4.5Ω Cold		220629-1	
R34	220Ω		220551B-221M	
R35	22Ω		220551B-220M	
R36	1Ω		2090438-7	10" Cupron Wire

Note 1. Some versions may use 150K in this application (Part #220551B-154M).
Note 2. Some versions may use 47K in this application (Part #220551B-473K).
Note 3. Some versions may use 3900Ω in this application (Part #220551B-392K).
Note 4. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	
L1	Ant. Coil	*					
L2	Cathode Choke	2090532-1	19-4400▲	TV-202▲	6136▲		421 microhenries; wound on 820mmf.
L3	IF Trap	2090088-3					50 microhenries; wound on 18K.
L4	RF Coil	*					
L5	Osc. Coil	*					
L6	Input IF	2090492-1					
L7	Output IF	2090493-1					
L8	RF Choke	2090671-1	19-1003	BC-564	4608		3.9 microhenries; IRC Part #CL-1
L9	"A" Lead Choke	216188-14					

* Part of M3 (or tuner coil assembly Part #2090679-1).
▲ Parallel with an 820mmf cap.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5	:1	2090265-2						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	300CT	3-4Ω	2090266-2							

* Element open at center of range—2meg each side.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BENDIX PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	2090296-1 ①	69A2	① (Front) Alternate Part No. 282634-7
SP2	6" x 9"	PM	3-4Ω	2090539-1 ②	69A2	② (Rear) Alternate Part No. 282634-8

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BENDIX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	9A. 32V.	SFE-9	221634-7				

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M2	Lamp	53	#1892
M3	Tuner	2090453-1	
M4	Switch	2090555-1	Power On-Off
M5	Switch	2090673-1	Motor Reversing, Includes Mounting Plate Ass'y.
	Switch	2090403-3	Foot
M6	Switch Ass'y.	2090678-1	Seek Sensitivity, Includes Escutcheon
	Switch Ass'y.	2090677-1	Seek, Includes Tuner Mounting Bracket, Pointer Pivot, Lamp Holder
M7	Relay Ass'y.	2090507-1	Includes Mounting Board
M8	Clutch Ass'y.	2090046-3	Magnetic
M9	Motor	2090533-1	Tuner Drive

CABINETS & CABINET PARTS

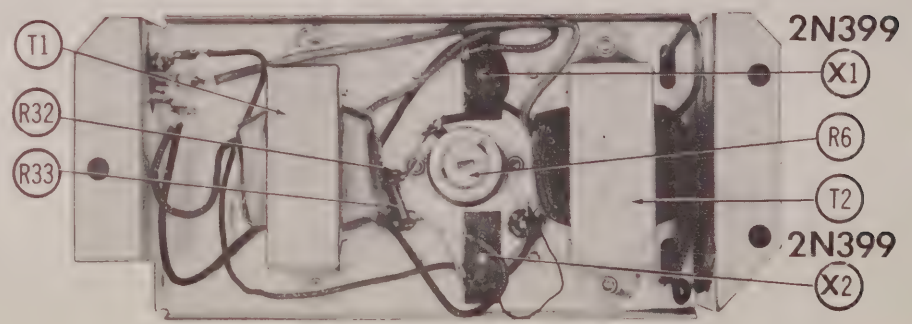
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

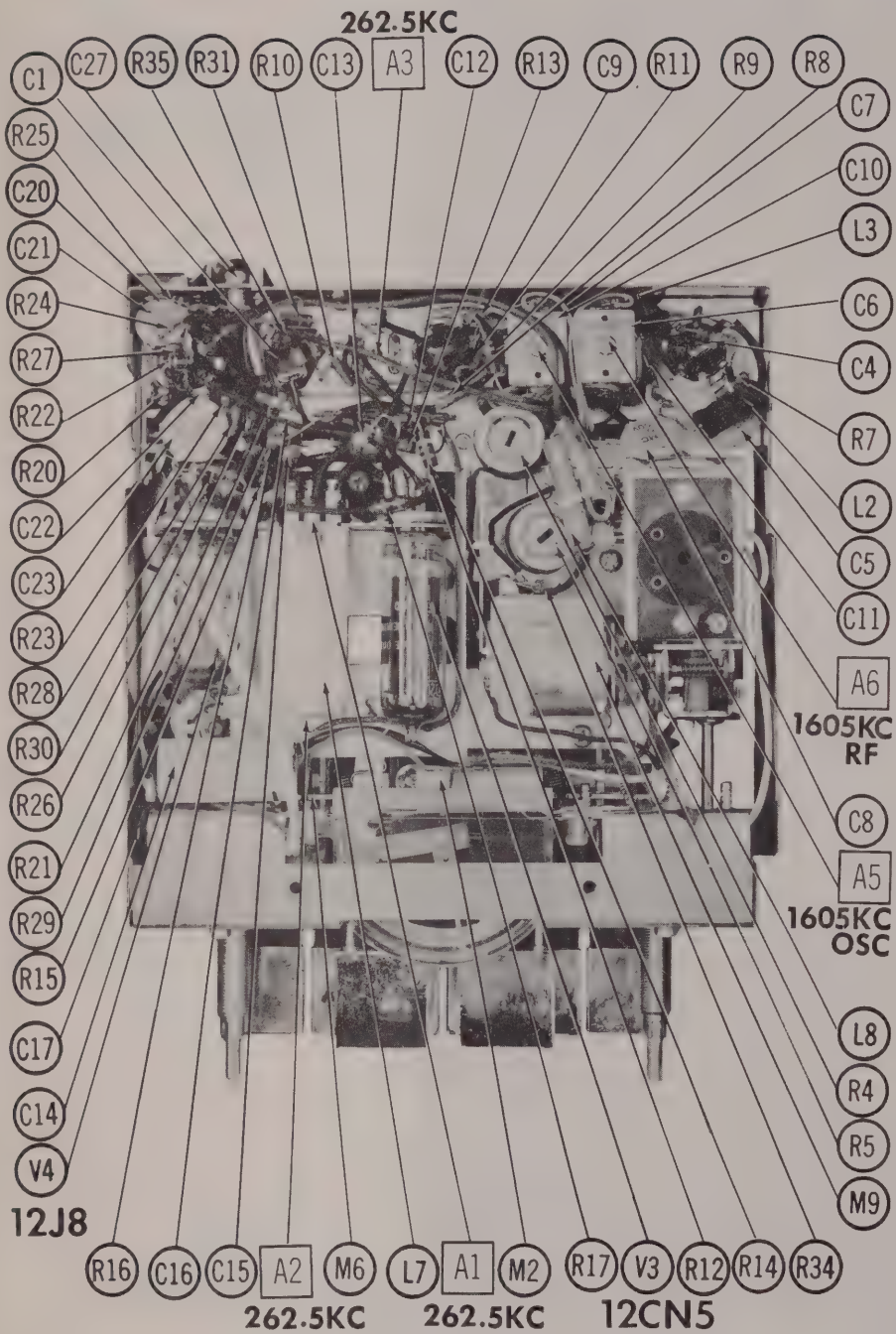
NAME	PART NO.	DESCRIPTION
Knob Ass'y.	2090282-1	
Disc	2090278-1	Tone, Fader
Cover Ass'y.	2090672-1	Top
Cover	2090488-1	Bottom
Pushbutton	2090279-1	Less Cap, 6 Used
Pushbutton Cap	2090280-1	Station, 5 Used
Pushbutton Cap	2090280-2	Off
Pointer	2090674-1	Includes Arm and Connecting Stud Assembly
Dial	2090330-1	Calibrated

WIRING DATA

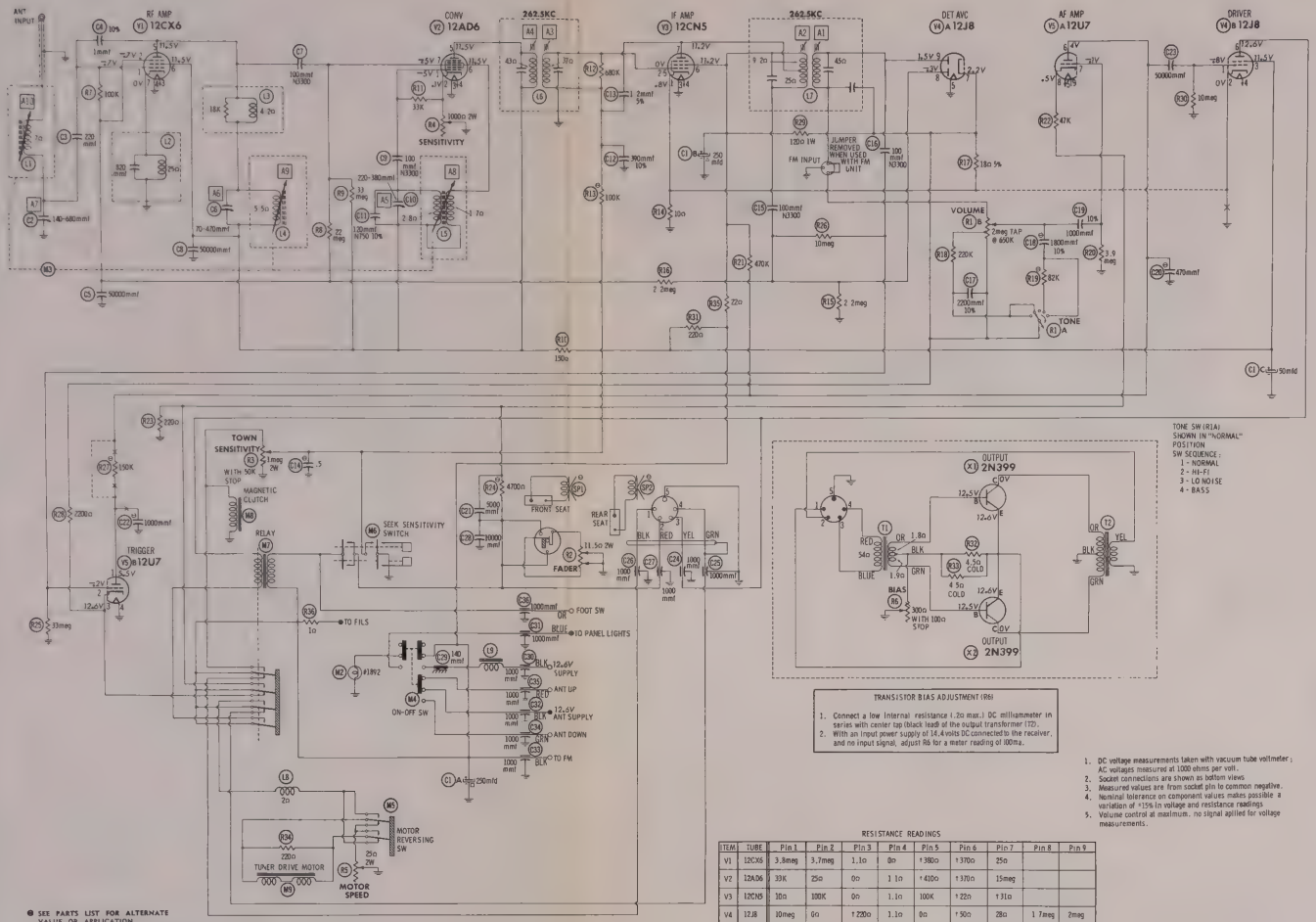
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

POWER CHASSIS





CHASSIS BOTTOM VIEW



TRANSISTOR BIAS ADJUSTMENT (R6)

1. Connect a low internal resistance (.2Ω max.) DC milliammeter in series with center tap (black lead) of the output transformer (T2).
2. With an input power supply of 14.4 volts DC connected to the receiver, and no input signal, adjust R6 for a meter reading of 100ma.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12CX6	3.8meg	3.7meg	1.1Ω	0Ω	†380Ω	†370Ω	25Ω		
V2	12AD6	33K	25Ω	0Ω	1.1Ω	†410Ω	†370Ω	15meg		
V3	12CN5	10Ω	100K	0Ω	1.1Ω	100K	†22Ω	†31Ω		
V4	12J8	10meg	0Ω	†220Ω	1.1Ω	0Ω	†50Ω	28Ω	1.7meg	2meg
V5	12U7	†520K	10meg	†0Ω	0Ω	1.1Ω	†470K	3.9meg	47K	NC

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM JUNCTION OF R31 and R36.
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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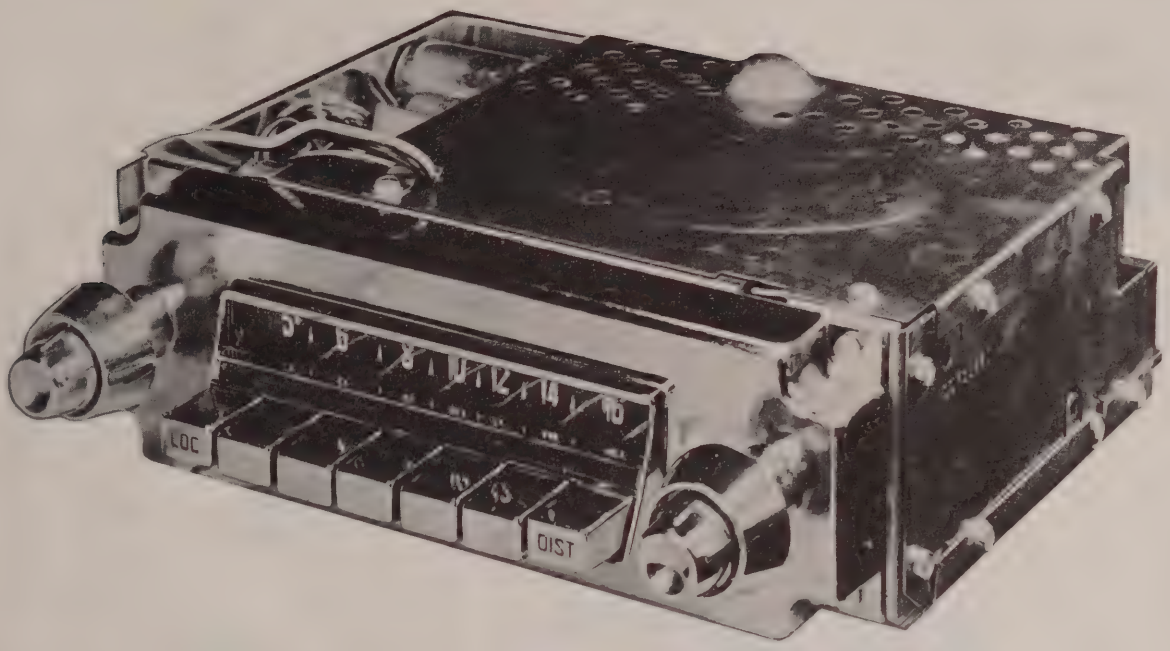
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOPAR MODEL 924HR (C-5809)

MOPAR MODEL 924HR (C-5809)



TRADE NAME	Mopar Model 924 (C-5809)
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output
TUBES (Five)	Types 12BL6 RF Amplifier, 12AD6 Converter, 12CX6 (or) 12BL6 IF Amplifier, 12DL8 Det.-AVC-Driver, 12U7 Trigger-AF Amplifier
POWER SUPPLY	12 Volt Storage Battery
RATING	1.1 Amp. @ 12.6 Volts DC (1.3 Amp. when seeking)
TUNING RANGE—BROADCAST	540 - 1610KC

MOPAR MODEL 924HR (C-5809)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.047mfd	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis	262.5KC (400∿ Mod.)	Tuning gang fully open	DC probe to point A. Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
3.	Fig. 1	Thru dummy antenna to antenna receptacle	1610KC	1610KC	Output Meter across voice coil	A5, A6, A7	Adjust for maximum output.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1200KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station. 2. Pull out pushbutton, then press in firmly. 3. Repeat for remaining pushbuttons.

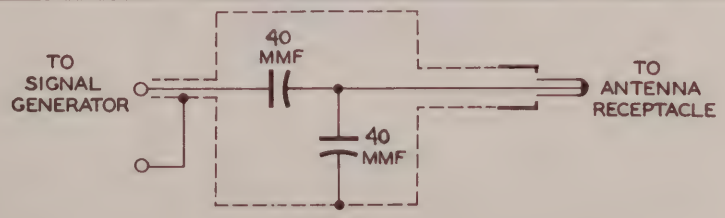


FIG. 1

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H620

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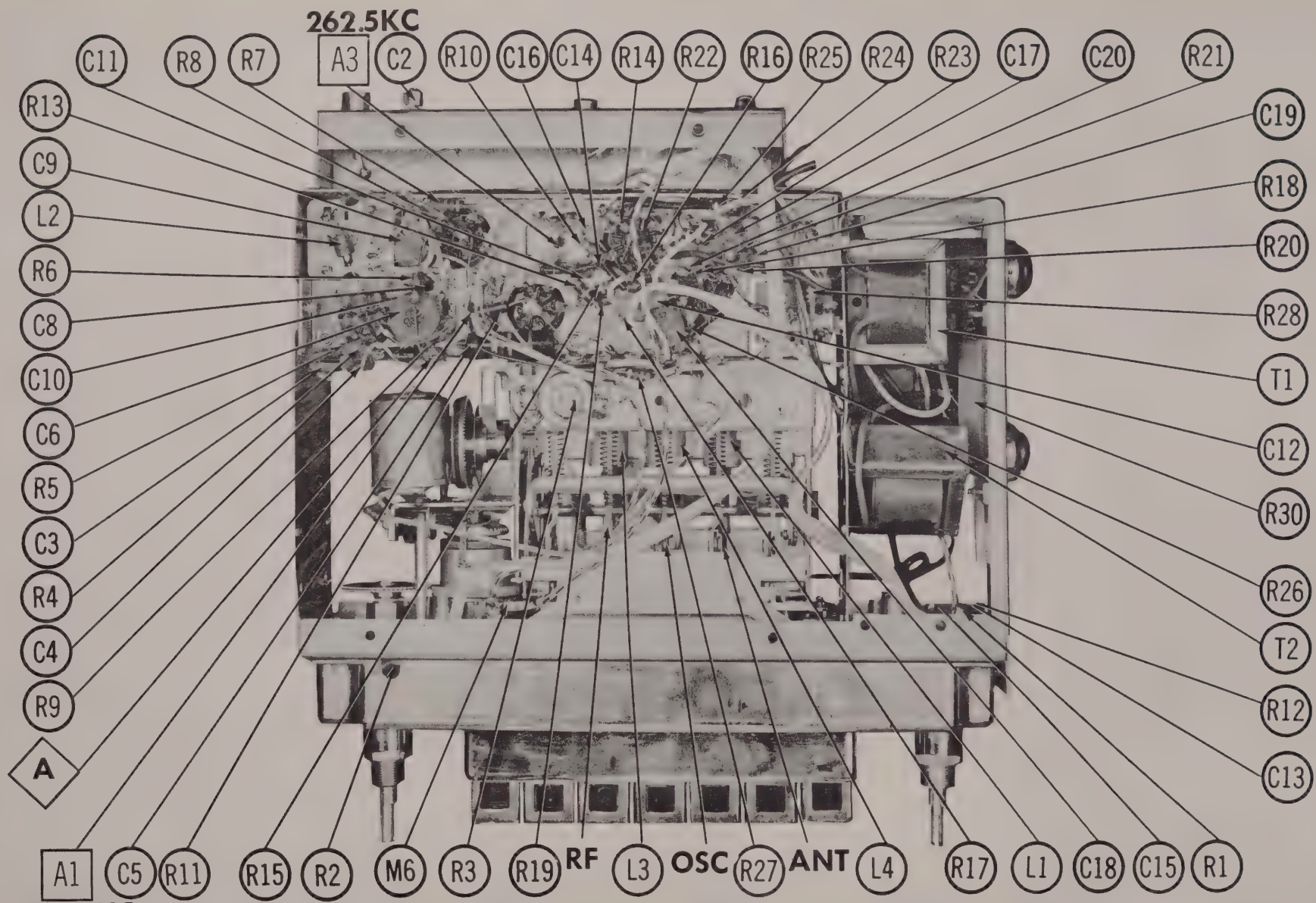


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	
V2	Converter	12AD6	
V3	IF Amplifier	12CX6	Note 1
V4	Det.-AVC-Driver	12DL8	
V5	Trigger-AF Amplifier	12U7	

Note 1. Some versions may use 12BL6 in this application.

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	AR9	Output	CBS-2N236A			2N350	
X2	AR9	Output	CBS-2N236A			2N350	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■500	16	61-0086-10	AFH3-54-50		WP200.7			R2665 *
B	▲200	16				TT25X5			
C	5	25							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

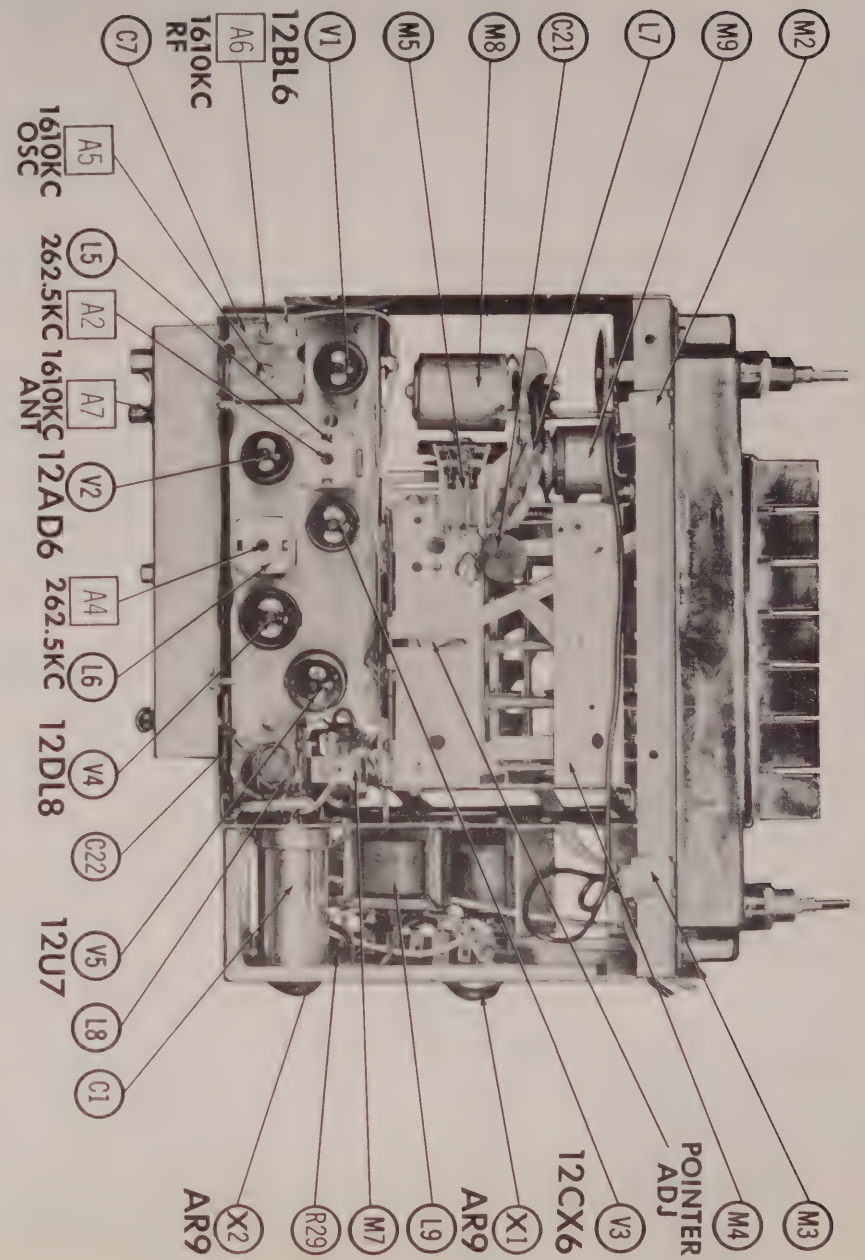
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	4-80		31-6533-1						
C3	100		30-1251-22	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C4	10		30-1251-6	BPD-00001	DD-100	L10Q1	UC-541	5GA-Q1	
C5	.047	200	30-4650-45	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C6	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511		
C7A									
B			31-6522-8						
C	100								
C8	33		30-1251-9	BPD-000033	DD-330	L10Q33	UC-5433	5GA-Q33	
C9	100		30-1251-22	N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1	N750
C10	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C11	220		30-1238-4	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C12	10000		30-1238-6	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C13	4000		30-1238-18	BPD-004	DD-402	BYA10D4	UC-524	5GA-D4	
C14	100		30-1238-11	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C15	100		30-1238-11	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C16	100		30-1238-11	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C17	10000		30-1238-6	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C18	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C19	220		30-1238-4	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C20	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C21	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	Note 1
C22	300		30-1254-1						

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4meg *	½	33-5580-19					Tone
B	1meg	½						Volume, Tap @ 250K
C	Switch							Power On-Off
R2	30Ω	2(WW)	33-5576-5					Speaker Fader
R3	150Ω	2(WW)	33-5591-4		39-150		FL-150	Search Sensitivity

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PHILCO PART No.	NOTES
R4	150K		66-4158340	
R5	1200Ω		66-2128340	
R6	6.8meg		66-5688340	
R7	47K		66-3478340	
R8	1meg		66-5108340	
R9	22meg		66-6228340	
R10	1.2meg		66-5128340	
R11	4.7meg			①
R12	100K		66-4108340	
R13	100K		66-4108340	②
R14	100Ω		66-1108340	
R15	470Ω		66-1478340	
R16	1meg		66-5108340	
R17	3.3meg		66-5338340	
R18	68Ω		66-0688340	
R19	470Ω		66-1478340	
R20	3.3meg		66-5338340	
R21	220K		66-4228340	
R22	3.3meg		66-5338340	
R23	56Ω		66-0568340	
R24	4.7Ω		66-9473360	
R25	33Ω		66-0338340	
R26	1.5meg		66-5158340	
R27	330Ω		66-1338340	
R28	470Ω		66-1478340	③
R29	4.7Ω		66-9473260	
R30	330Ω	7	33-1367-4	④

① Some versions use 10meg in this application
② Some versions use 220K in this application
③ Some versions use 220Ω in this application
④ Temperature compensating unit.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PHILCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Antenna Coil	32-4730-19					Note 1
L2	RF Choke	32-4480-24	19-3160	TV-196	6120		150 Microhenries
L3	RF Coil	32-4730-20					Note 1
L4	Osc. Coil	32-4730-21					Note 1
L5	Input IF	32-4676-2	16-6756	BC-344	12-H1	RF3	
L6	Output IF	32-4677-8					
L7	RF Choke						7.5 Microhenries; IRC Part #CL-1
L8	"A" Lead Choke	32-4720-3					

Note 1. Part of Tuner Assembly Part #76-10378-1.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L9	.011A @ 12.6VDC	19Ω	.5 Hy.	32-8788						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3	:1	32-8835				TR-66 ①		① Drill new mounting hole

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	60Ω CT	3-4Ω	32-8834							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	QUAM PART No.	NOTES
SP1	5" X 7"	PM	3-4Ω	36-1670-2	57A15	
SP2	5" X 7"	PM	3-4Ω	36-1670-2	57A15	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PHILCO PART No. FUSE	PHILCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	SFE	7½A 32V	45-2656-53		30707.5 (7½A 32V)	155009	SFE7½	HDH

MISCELLANEOUS

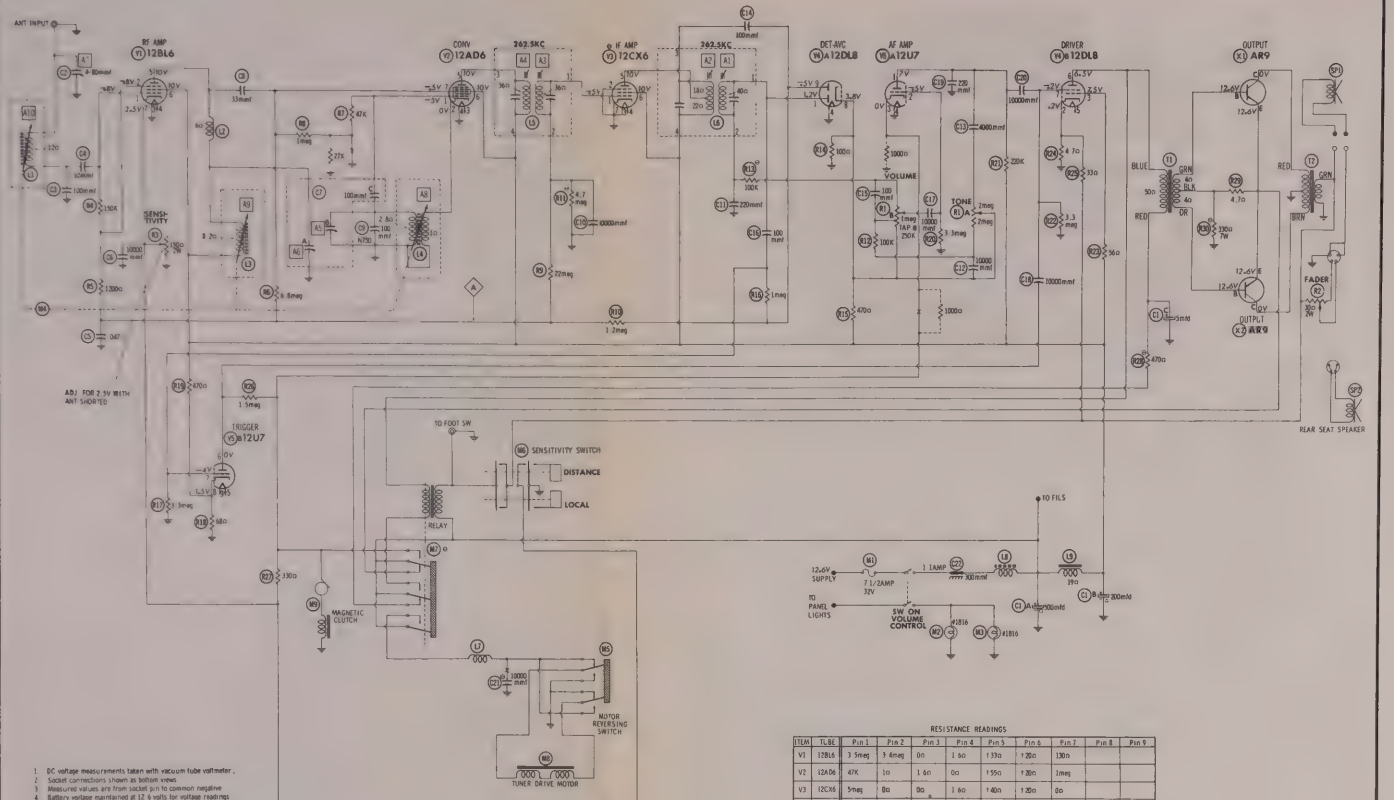
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	Lamp	32-2064	#1816
M3	Lamp	32-2064	#1816
M4	Tuner	76-10378-1	Complete
M5	Switch	76-11522	Motor Reversing
M6	Switch Ass'y	76-11411-3	Sensitivity
M7	Relay	42-4033	Alternate Part #42-4032
M8	Motor	76-11379-1	Tuner Drive, Includes Bracket Assembly
M9	Clutch	76-11519	Magnetic

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	3.5meg	3.4meg	0Ω	1.6Ω	133Ω	120Ω	130Ω		
V2	12AD6	47K	1Ω	1.6Ω	0Ω	155Ω	120Ω	1meg		
V3	12CX6	5meg	0Ω	0Ω	1.6Ω	140Ω	120Ω	0Ω		
V4	12DL8	1.3meg	14.7Ω	175Ω	0Ω	1.6Ω	1470Ω	3.3meg	100Ω	3meg
V5	12U7	220K	3.3meg	330Ω	0Ω	1.6Ω	1.5meg	2.5meg	68Ω	NC

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE
↑ MEASURED FROM JUNCTION OF C22 AND L8
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views
3. Measured values are from socket pin to common negative
4. Battery voltage maintained at 12.6 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Values control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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PHOTOFACT* Folder

with CIRCUITRACE*

MOTOROLA MODELS 6X39A, -1 , -2 (Ch. HS-630, HS-683, HS-684)

MOTOROLA MODELS 6X39A, -1 , -2 (Ch. HS-630, HS-683, HS-684)

MODEL 6X39A-2

MOTOROLA MODELS 6X39A, -1 , -2 (Ch. HS-630, HS-683, HS-684)

TRADE NAME	Motorola Models 6X39A (Ch. HS-630), 6X39A-1 (Ch. HS-683), 6X39A-2 (Ch. HS-684)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 2 Band Portable AM Transistorized Receiver
POWER SUPPLY	6 Volts DC
TUNING RANGE - BROADCAST	535 - 1620KC
BEACON	200 - 420KC
RATING	9MA @ 6 Volts DC (No Signal, Min. Volume)
	18MA @ 6 Volts DC (Signal, Normal Volume)

DISASSEMBLY

1. Remove volume control knobs.
2. Remove screw from center of tuning knob. Remove knob.
3. Remove screw located under tuning knob.
4. Open rear cover. Turn handle to right angle of printed board.
5. Hold handle near one mounting end and pull out from cabinet side to clear round part of mounting and bushing. Lift this side of handle and chassis clear of cabinet.
6. Repeat step 5 for other end of cabinet.
7. To remove printed board from speaker mounting plate:
   a. Unsolder wire from tuning gang to printed board.
   b. Remove speaker, earphone jack, antenna and battery leads from printed board.
   c. Unsolder 3 chassis mounting support lugs.

HANDLE (LOOP) REPLACEMENT

1. Perform the 7 steps above.
2. Unsolder antenna leads from printed board.
3. Turn handle to right angle of printed board.
4. Slide handle out of clips.

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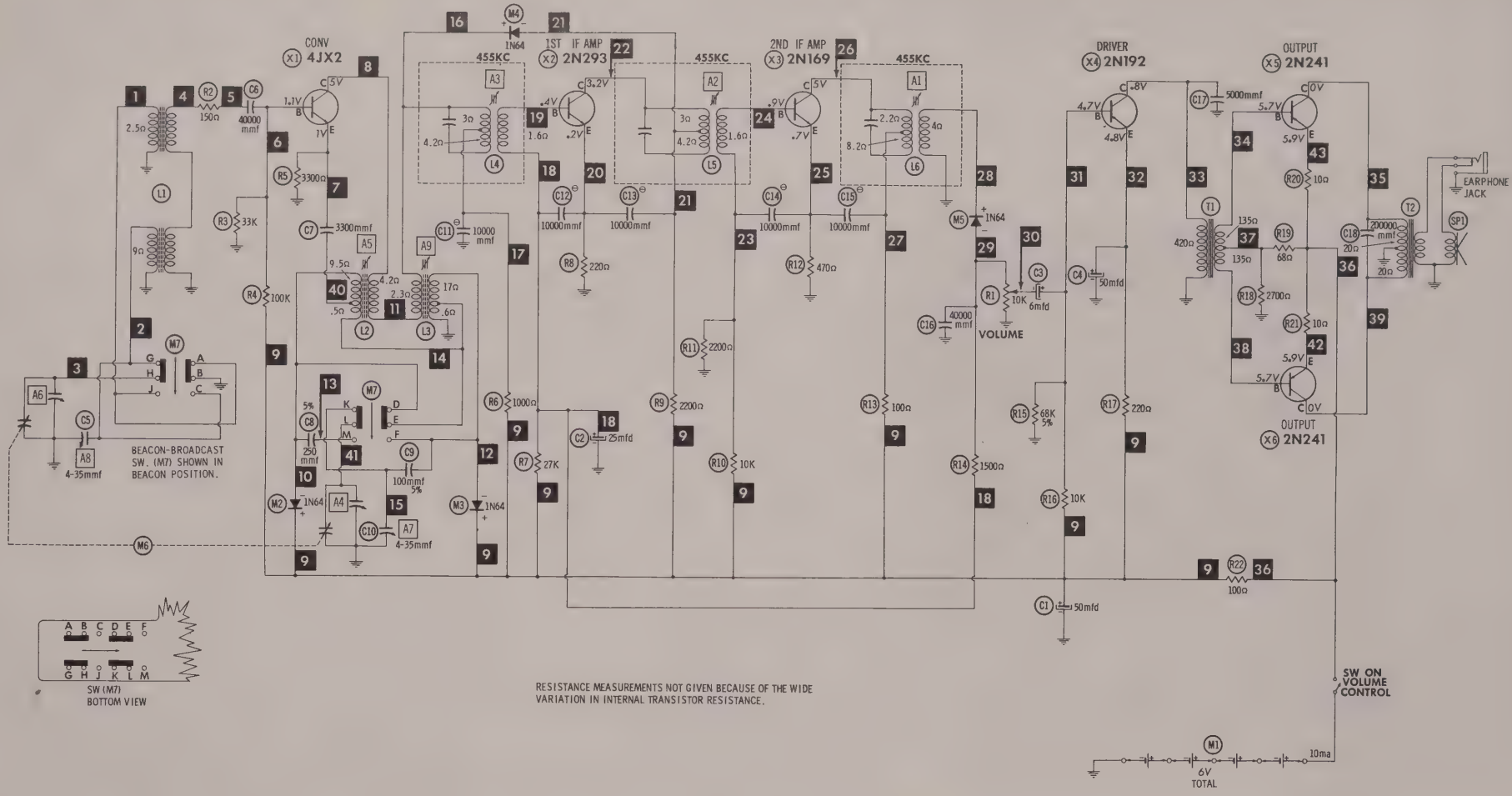

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE*
*TRADE MARK

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	4JX2	Converter	2N439				NPN
X2	2N293	1st IF Amplifier	2N439			2N410	NPN
X3	2N169	2nd IF Amplifier	2N439			2N169	NPN
X4	2N192	Driver		2N408	2N362	2N109	PNP
X5	2N241	Output	2N180	2N408	2N632	2N241A	PNP
X6	2N241	Output	2N180	2N408	2N632	2N241A	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	10	23B637402	XPP-10050	NL50-10	TT10X50	ML50-10		TE-1160
C2	25	3	23K637758	XPP-3025	NL25-3	TT3X25	ML25-3		TE-1055
C3	6	10	23K636769	XPP-10006	NL6-25	TT12X5	ML6-15		TE-1153
C4	50	10	23B637402	XPP-10050	NL50-10	TT10X50	ML50-10		TE-1160

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	4-35		20A639736						
C6	40000		21B635399						
C7	3300		21R120422	BPD-0033	DD-332	BYA10D33	UC-5233	5HK-D33	
C8	250		21K639841	1469-00025		22R5T25		MS-325	5%
C9	100		21K639842	1469-0001		22R5T1		MS-31	5%
C10	4-35		20A639736						
C11	10000		21R128284	BPD-01	DD-103	BYA6S1	DC511	TG-S10	①
C12	10000		21R128284	BPD-01	DD-103	BYA6S1	DC511	TG-S10	①
C13	10000		21R128284	BPD-01	DD-103	BYA6S1	DC511	TG-S10	①
C14	10000		21R128284	BPD-01	DD-103	BYA6S1	DC511	TG-S10	①
C15	10000		21R128284	BPD-01	DD-103	BYA6S1	DC511	TG-S10	①
C16	40000		21B635399						
C17	5000		21R115312	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C18	200000		21B637403						

① Model 6X39A uses Part #21K635404 in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A B	10K Switch	1/4	18B637419		44S-10K-W			Volume

RESISTORS

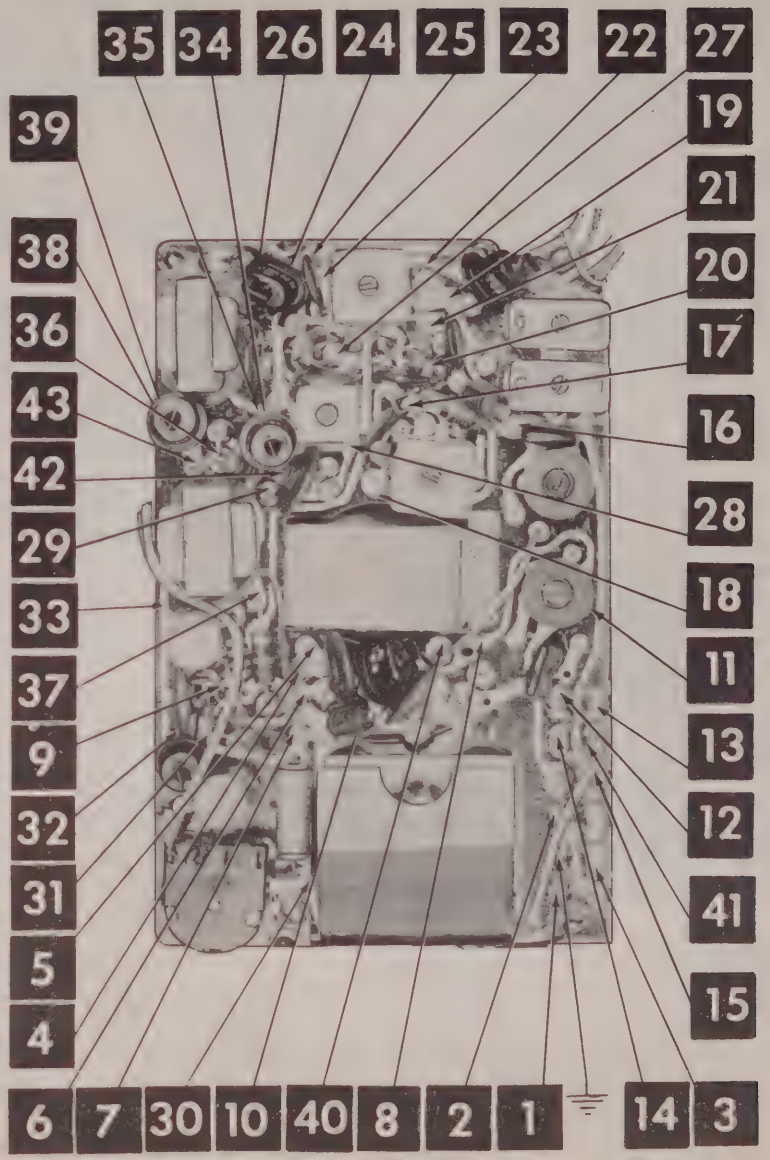
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R2	150Ω		6K124797	
R3	33K			
R4	100K		6K125534	
R5	3300Ω		6K121725	
R6	1000Ω		6K121301	
R7	27K		6K121300	
R8	220Ω		6R6270	
R9	2200Ω		6R6069	
R10	10K		6K119932	
R11	2200Ω		6R6069	
R12	470Ω		6K127633	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R13	100Ω		6R6326	
R14	1500Ω		6R6038	
R15	68K 5%		6R6074	
R16	10K		6K119932	
R17	220Ω		6R6270	
R18	2700Ω		6K119926	
R19	68Ω		6R2039	
R20	10Ω		6K124668	
R21	10Ω		6K124668	
R22	100Ω		6R6326	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	Loop Stick	1V640778					Includes handle assembly; Model 6X39A-2
B	Loop Stick						
	Loop Stick	1V639844					Includes handle assembly; Models 6X39A & 6X39A-1
	Loop Stick						
L2	BC Osc. Coil	24K639888					
L3	Beacon Osc. Coil	24K639889					
L4	1st IF	24K640526					Models 6X39A-1, -2
	1st IF	24C637482					Model 6X39A
L5	2nd IF	24K640527					Models 6X39A-1, -2
	2nd IF	24K637709					Model 6X39A
L6	3rd IF	24K637483					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1.5	: 1	25B636770	GH113 ①			TR-3 ①		① Use original channel frame.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	325Ω CT	13Ω	25K637642	GH119 ①			TA-20	TR-16 ①		① Use original channel frame.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	2 3/4"	PM	13Ω	50B637439		

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	6V			Z ①		1015 ①		M-15R ① ZM-9①②	① Four used. ② Mercury

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MOTOROLA PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	742	48K636691	1N64	1N295	Limiter (Pigtail)
M3	742	48K636691	1N64	1N295	Limiter (Pigtail)
M4	742	48K636691	1N64	1N295	Limiter (Pigtail)
M5	1N295	48K636778	1N64	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M6	Tuning Cap.	19B639741	2 Gang (Ant. 10-212mmf, Osc. 22-200mmf)
	Printed Board	84B639716	Model 6X39A, Less all components
	Printed Board	84K640650	Models 6X39A-1, -2, Less all components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36C639907	Tuning
Knob	36K639905	Volume
Cabinet	1V640751	Models 6X39A, 6X39A-1
Cabinet	1V640898	Model 6X39A-2
Cabinet Front	1V640748	Models 6X39A, 6X39A-1
Cabinet Front	1V640317	Model 6X39A-2
Cabinet Back	1V640749	Models 6X39A, 6X39A-1, 6X39A-2
Grille	13B639644	Grille

WIRING DATA

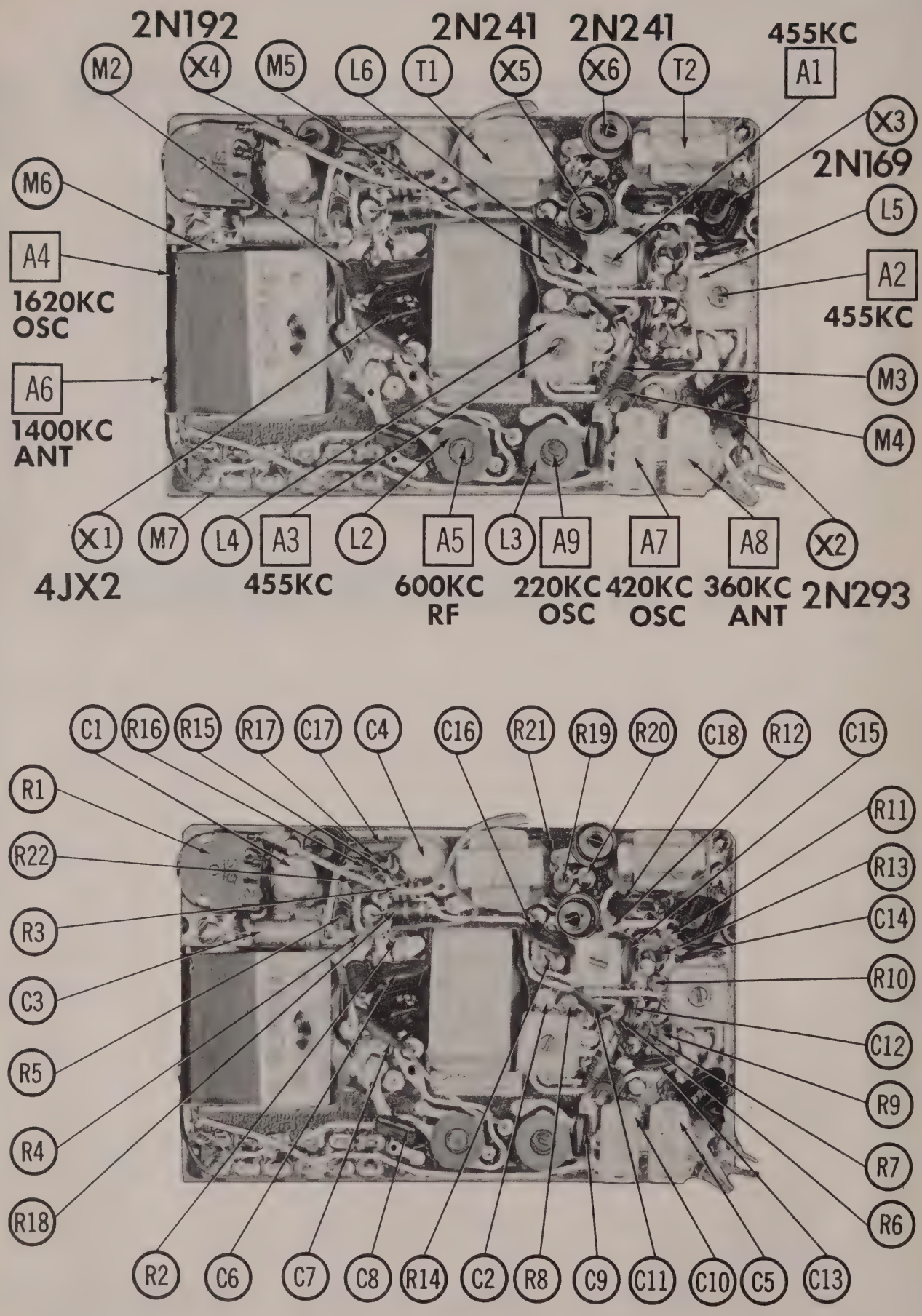
General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug of tuning gang. Low side to B-.	455KC (400~ Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	1620KC	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	"	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang. Repeat steps 2 & 3.
4.		"	1400KC	"	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
5.		"	420KC	Beacon	Tuning gang fully open	"	A7	Screw in A8. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
6.		"	360KC	"	Tune to 360KC	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.		"	220KC	"	Tune to 220KC	"	A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang. Repeat steps 5 & 6.



CHASSIS TOP VIEW

PHOTOFACT* Folder

*TRADE MARK

NORELCO
MODEL EL3516

NORELCO
MODEL EL3516

NORELCO
MODEL EL3516

GENERAL INFORMATION

Norelco Continental Model EL3516 tape recorders record and play back two tracks of recorded material on standard-width recording tape, thus doubling recording and playing time without loss of quality or frequency response. Recordings can be made from a phonograph, radio, or television receiver, in addition to those made directly from a microphone.

The Continental Model EL3516 has three speeds, 1 7/8, 3 3/4, and 7 1/2 ips. Using both tracks, recording time is as follows:

Reel Size	1 7/8 ips	3 3/4 ips	7 1/2 ips
5" (600')	2 hours	1 hour	1/2 hour
7" (1200')	4 hours	2 hours	1 hour

Connect this recorder to a 110-volt, 60-cycle AC supply only.

Manufactured by:

North American Philips Company
High Fidelity Products Division
230 Duffy Avenue
Hicksville, Long Island, New York

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

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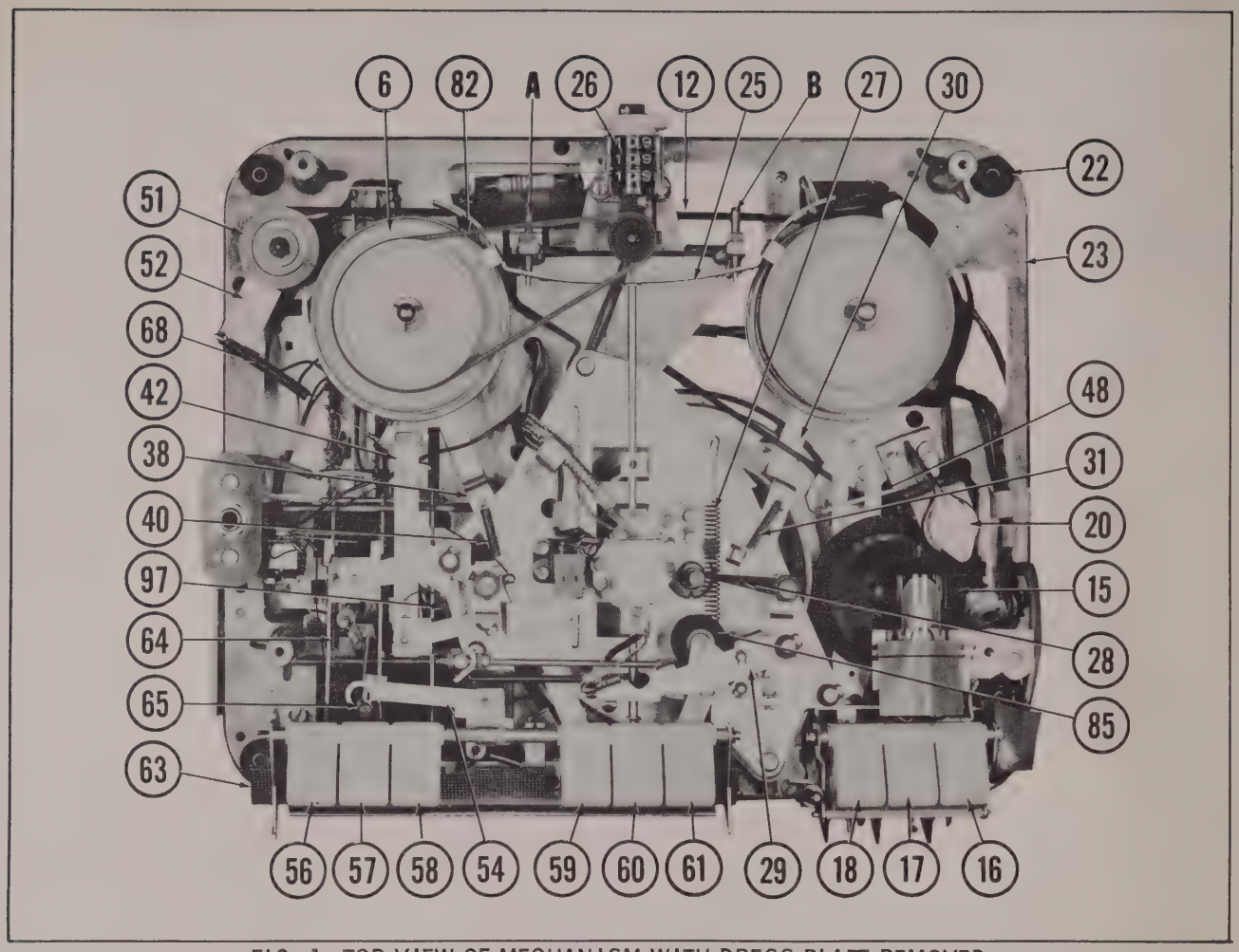


FIG. 1 TOP VIEW OF MECHANISM WITH DRESS PLATE REMOVED

SPECIFICATIONS

Frequency Response:

40-16,000 cps at 7 1/2 ips
50-8,000 cps at 3 3/4 ips
60-4,500 cps at 1 7/8 ips

Wow and Flutter:

0.15% at 7 1/2 ips
0.2% at 3 3/4 ips
0.35% at 1 7/8 ips

Signal-to-Noise Ratio:

54 db

Input Impedance:

Microphone, 100 K ohms
Phono/Radio, 800 K ohms

Sensitivity:

Microphone input, 3 mv
Phono/Radio input, 330 mv

Output Impedance:

For external speaker, 5 ohms
For external amplifier, 5.6 ohms.

Power Output:

2.5 watts

Power Consumption:

55 watts

Dimensions:

15 3/4" x 13" x 8"

MAINTENANCE

After extensive use the rubber intermediate wheels may get dirty, causing slippage. Clean with a damp cloth. Do not use carbon tetrachloride.

Magnetic heads, pressure roller, and spindle should be cleaned regularly with a damp cloth.

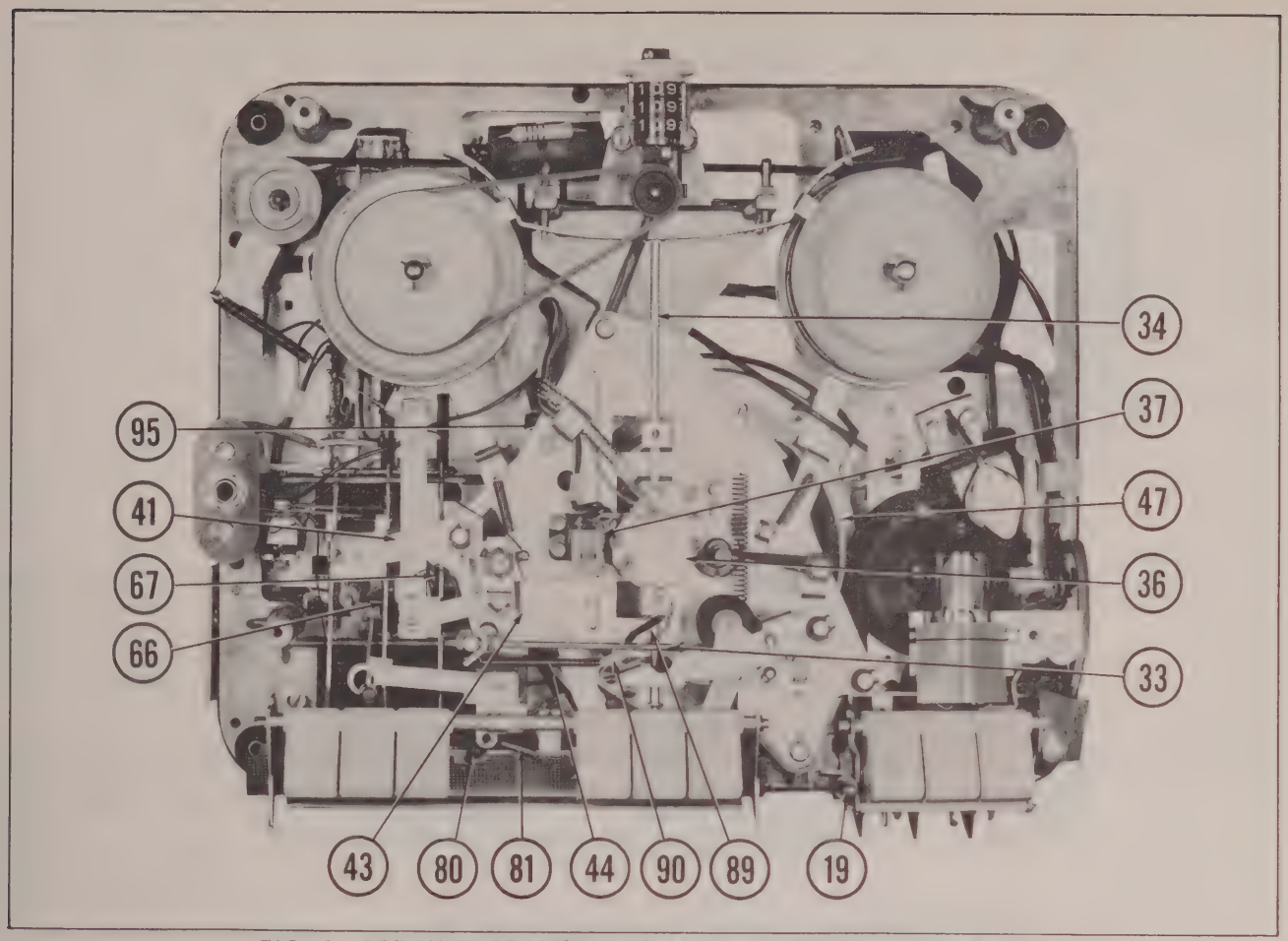


FIG. 2 TOP VIEW OF MECHANISM WITH DRESS PLATE REMOVED

OPERATING INSTRUCTIONS

Speed Control

Depressing the desired speed selector push button causes the corresponding intermediate wheel to contact pulley (21) and flywheel (47). Pulley (21) drives intermediate wheel (15), (101), or (102), which in turn drives flywheel (47). The larger diameter pulley is for the fast speed, and the smaller pulley is for the slow speed.

Threading Tape

1. Place a reel of tape on left turntable (6) and an empty reel on right turntable (6), making certain that reel slots engage pins on reel turntables.
2. Unwind about 10" of tape from reel. Hold a section of tape taut with both hands and insert tape in tape slot, making sure dull-coated side of tape faces rear of recorder.
3. Insert end of tape into the radial slot in hub of take-up reel. Turn reel several turns counterclockwise until tape is secured to reel and all slack is taken up between reels.

To Record from Microphone

1. Turn on recorder by depressing one of the three speed selector push buttons. Allow sufficient time for tubes to warm up.
2. Insert microphone plug into Mic Input jack.
3. Depress record lock button (65) and record push button (57).
4. Hold microphone 6" to 12" away from mouth and speak in a normal voice. Adjust volume and tone controls for desired level.

To Record from Radio or Television Receiver

1. Place microphone about 6" to 12" in front of speaker. Turn receiver volume control to normal level. Turn tone control to treble or high. Set recording level and record as described under "To Record from Microphone."
2. Make a shielded cable with a two-conductor phono plug on one end and two alligator clips on the other end. Connect alligator clips across voice-coil terminals of speaker and insert plug into Radio-Phono jack. Set receiver volume and tone controls as described in Step 1. Set recording level and record as described under "To Record from Microphone."
3. Make a shielded cable with a two-conductor plug on one end. Connect other end across volume control. Insert phone plug into Radio-Phono jack. Set recording level and record as described under "To Record from Microphone." Receiver volume and tone controls have no effect on this setup and may be set in any position.

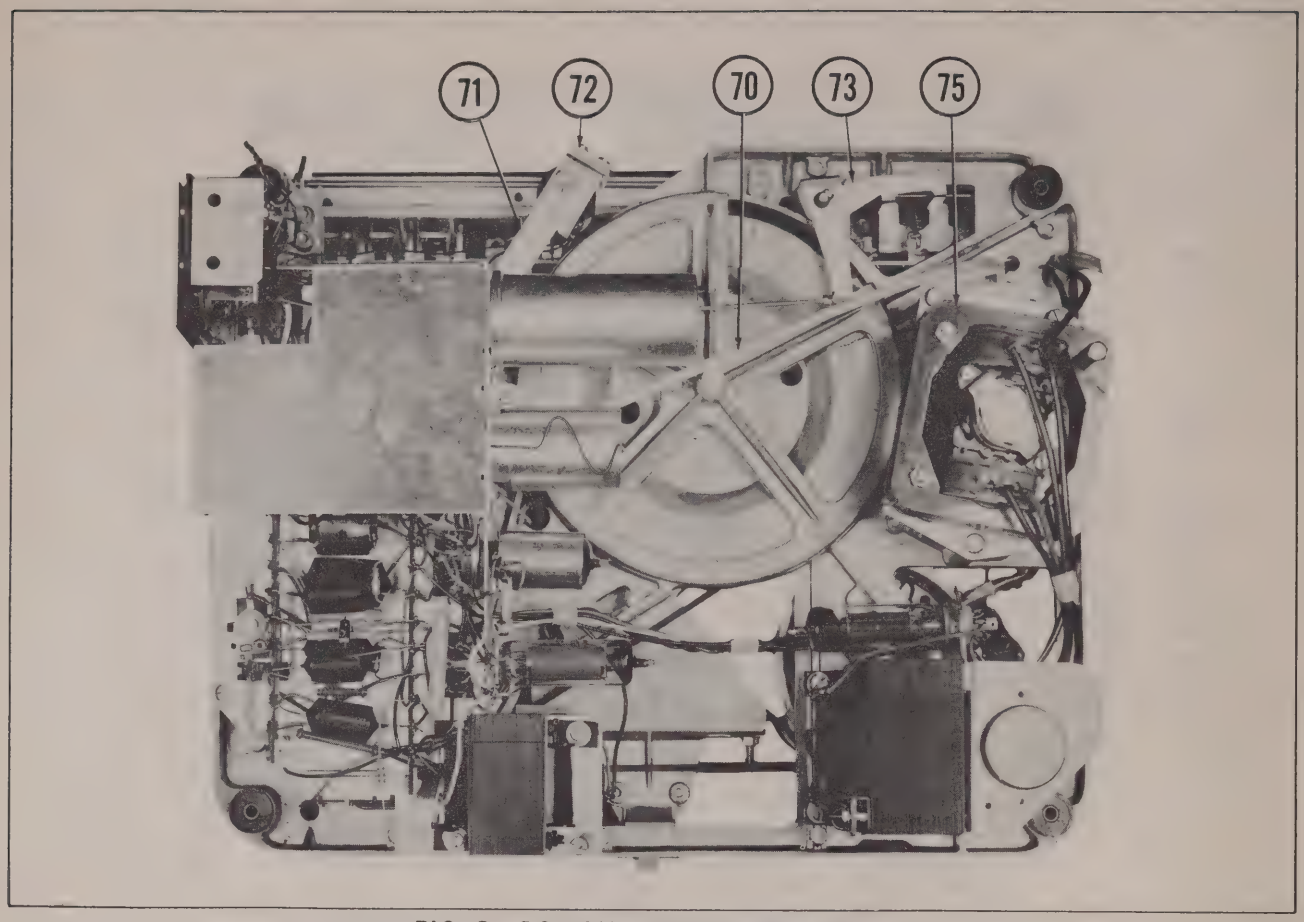


FIG. 3 BOTTOM VIEW OF MECHANISM

To Record from Record Player

1. If record player has a phone-type plug on pick-up leads, insert this plug into the Radio-Phono jack. Set recording level and proceed as described under "To Record from Microphone."

2. If record player has a standard pin-type plug, an adapter is needed. Insert pin plug into adapter and plug adapter into Radio-Phono jack.

Dual-Track Recording

This recorder will record and play back on one-half the width of the tape at a time. To record on other half of tape, remove full reel from right turntable (6), turn reel over and place on left turntable (6).

Fast Forward and Fast Rewind

For high-speed forward or rewind, depress the desired push button, (61) or (59). This will wind the tape on desired reel at a high speed. When finished, stop the mechanism by depressing stop push button (60).

Braking

To stop the tape at any time while operating in any position, depress stop push button (60). This pushes brake spring pressure rod (34) against brake spring coupling spring (25), which in turn is forced against driving disc (11), causing driving disc (11) and turntable (6) to stop.

To Play a Recording

1. Thread tape as described under "Threading Tape."

2. To turn on unit, depress desired speed selector push button.

3. Adjust volume and tone controls to desired listening level.

To Use an External Speaker

Connect the connecting cable to the external speaker terminals and External Speaker jack on recorder. The tape recorder speaker is disconnected when connecting cable is plugged into External Speaker jack.

To Erase a Recording

Any previous recording is automatically erased when a new recording is made. To erase a recording without recording new material, follow normal recording procedure, except set volume control fully counterclockwise.

Pause Control

To temporarily interrupt recording or playback, depress pause push button (58). Depress this control firmly because left-hand turntable is braked while pressure roller (85) is still pressing tape against spindle (9) on flywheel (47).

DISASSEMBLY INSTRUCTIONS

1. Remove six wood screws from panel on bottom of case. Remove panel.
2. Remove line cord from grommet in line cord storage compartment.
3. Remove push-on type volume and tone control knobs.
4. Lift front and rear escutcheons from top plate.
5. Remove five screws from top plate and lift off plate.
6. Remove hex nut and washer from each corner of mechanism plate.
7. Unsolder the two leads connected to speaker.
8. Carefully lift complete mechanism out of the case.

Replace mechanism by reversing the foregoing procedure. Make sure ground lead from speaker is reconnected under bottom plate.

ADJUSTMENTS

Record-Playback Head

1. Place a full reel of prerecorded dual-track tape, with music on one track and speech on the other, on left turntable (6). See "Threading Tape."
2. Depress speed selector and playback push buttons, and listen for cross talk between the two tracks.
3. If cross talk is heard, adjust record-playback head mounting screw (88).
4. Connect an AC voltmeter to output jack and adjust head for maximum output. This adjustment is made in playback position at 7 1/2 ips.

Erase Head

Adjust erase head so that top of core protrudes 1/64" above tape.

Bias Voltage

1. Depress one of the speed selector push buttons, and the record push button.
2. Connect an AC voltmeter between test points 2 and ground.
3. Adjust C17 for maximum deflection.

NOTE: This voltage should be 130 mv, and frequency at this voltage should be between 41 kc and 48 kc.

Oscillator Coil

1. Connect signal generator between test point 1 and ground.
2. Adjust signal generator output to 24 mv at 8,000 cps.
3. Connect AC voltmeter between test point 2 and ground.
4. Set volume control to its maximum position.
5. Depress the record and 3 3/4 ips push buttons.
6. Adjust L1 for a voltage of 11.7 mv output.

REPLACEMENT OF PARTS

Bearing Support (20) with Pulley (21)

1. Remove drive belt (12).
2. Hold motor fan (74) and give pulley (21) a few turns so that coupling spring (24) is turned away from pulley.
3. Remove set screws holding bearing support in place and remove bearing support.
4. Insert new bearing support, keeping motor plate in place, and turn pulley (21) so that coupling spring (24) goes back in place.
5. Remove flexible cable from arm of line switch.
6. Close switch by pushing up on lever. Do not depress speed selector push buttons.
7. Connect recorder to a 45-volt AC source.
8. Adjust bearing support (20) so that pulley (21) just starts turning and runs at full speed for a few seconds.
9. Be sure none of the intermediate wheels contact the pulley (21).
10. Tighten bearing support set screws.
11. Check to see if motor still runs on 45 volts AC.
12. Reconnect flexible cable.

Brake Spring Coupling Spring (25)

1. Be sure stop push button (60) is not depressed.

2. Push brake spring pressure rod (34) away from coupling spring (25) slightly.

3. Remove brake spring coupling spring (25).

4. Adjust so that felt pads are approximately 1/16" from driving disc (11).

5. If adjustment is needed, adjust set screws A and B (see Exploded View).

Intermediate Wheel (15)

1. Remove grease cap and "C" washer from top of wheel.

2. Loosen right-hand screw of speed selector push-button assembly.

3. Pull push-button assembly toward front of recorder slightly.

4. Remove intermediate wheel (15).

5. To reassemble, reverse the foregoing procedure.

Intermediate Wheel (101)

1. Remove intermediate wheel (15) as outlined previously.

2. Loosen two set screws of speed selector assembly and pull assembly towards front of recorder.

3. Lift bracket of upper intermediate wheel (15) and remove; then replace middle intermediate wheel (101).

4. Be certain that wire spring of bracket holder is pushed between middle and lower intermediate wheels.

Intermediate Wheel (102)

1. Loosen push-button assembly.

2. Swing line frame assembly with bracket and intermediate wheels outward.

3. Remove intermediate wheel (102).

4. When reassembling, be sure wire spring is between lower and middle brackets.

5. To reassemble, reverse the foregoing procedure.

Clutch Disc (7)

1. Be sure stop pushbutton (60) is not depressed.

2. Remove brake band at end of brake spring coupling spring (25).

3. Remove turntable (6).

4. Remove clutch disc (7) and spindle (9).

5. To replace, reverse the foregoing procedure.

Flywheel (47)

1. Remove index counter drive belt (82).

2. Remove brake spring coupling spring (25) and brake spring pressure rod (34).

3. Remove driving discs (11), turntables (6), fast forward lever (30), and fast rewind lever (38).

4. Unsolder leads from contacts of switch M7 and from heads (36) and (37).

5. Remove three screws holding intermediate plate (95) and remove intermediate plate (95).

6. Remove flywheel (47).

7. Make sure new flywheel is properly centered and does not bind at any point.

8. To reassemble, reverse the foregoing procedure.

TROUBLE CHART

Symptom	Cause	Remedy
Tape rewinds too slowly.	1. Drive belt (12) greasy or stretched.	1. Clean or replace drive belt (12).
Tape loops.	1. Brake spring coupling spring (25) improperly adjusted.	1. See "Brake Spring Coupling Spring (25)" under "Replacement of Parts."
Reels wobble.	1. Spindle (9) bent.	1. Straighten or replace spindle (9).
	2. Unused intermediate wheel touches pulley (21).	2. Check guiding brackets (103).
	3. Turntables (6) touch driving disc (11).	3. Replace clutch disc (7).
Tape bounces at start of playback or record.	1. Flywheel (47) greasy.	1. Clean flywheel (47) with carbon tetrachloride.
	2. Clutch disc (7) sags, letting turntable (6) drag on driving disc (11).	2. Replace clutch disc (7).

TROUBLE CHART (CONT)

Symptom	Cause	Remedy
Tape speed too slow.	1. Dry flywheel (47) bearing.	1. Lubricate flywheel (47) bearing.
Bearing support (20) or coupling spring (24) whistles.	1. No lubrication on pulley (21) bearing.	1. Lubricate pulley (21) bearing.
	2. Bearing support (20) or motor (75) spindle shifted axially.	2. Replace bearing support (20).
	3. Coupling spring (24) twisted.	3. Adjust coupling spring (24).
Idler wheel (51) squeals.	1. Idler wheel bearing (52) dirty.	1. Remove idler wheel (51) and clean and lubricate idler wheel bearing (52).
Automatic stop fails to function.	1. End-of-tape switch (39) misadjusted.	1. Readjust end-of-tape switch (39).
	2. Relay (M11) may be open.	2. Check relay (M11) and replace if necessary.
Playback output too low.	1. Record-playback head (36) misadjusted.	1. Adjust record-playback head (36).
	2. Amplifier tubes weak.	2. Check tubes and replace if necessary.
Index counter (26) does not function.	1. Index counter drive belt (82) broken.	1. Replace index counter drive belt (82).
Speed slower than normal.	1. Intermediate wheel (15), (101), or (102) dirty or worn.	1. Clean or replace appropriate wheel.
Recorder does not operate with speed selector switch on.	1. Defective line switch.	1. Repair or replace switch.
	2. Broken line cord.	2. Replace line cord.
	3. Blown line fuse.	3. Replace line fuse.

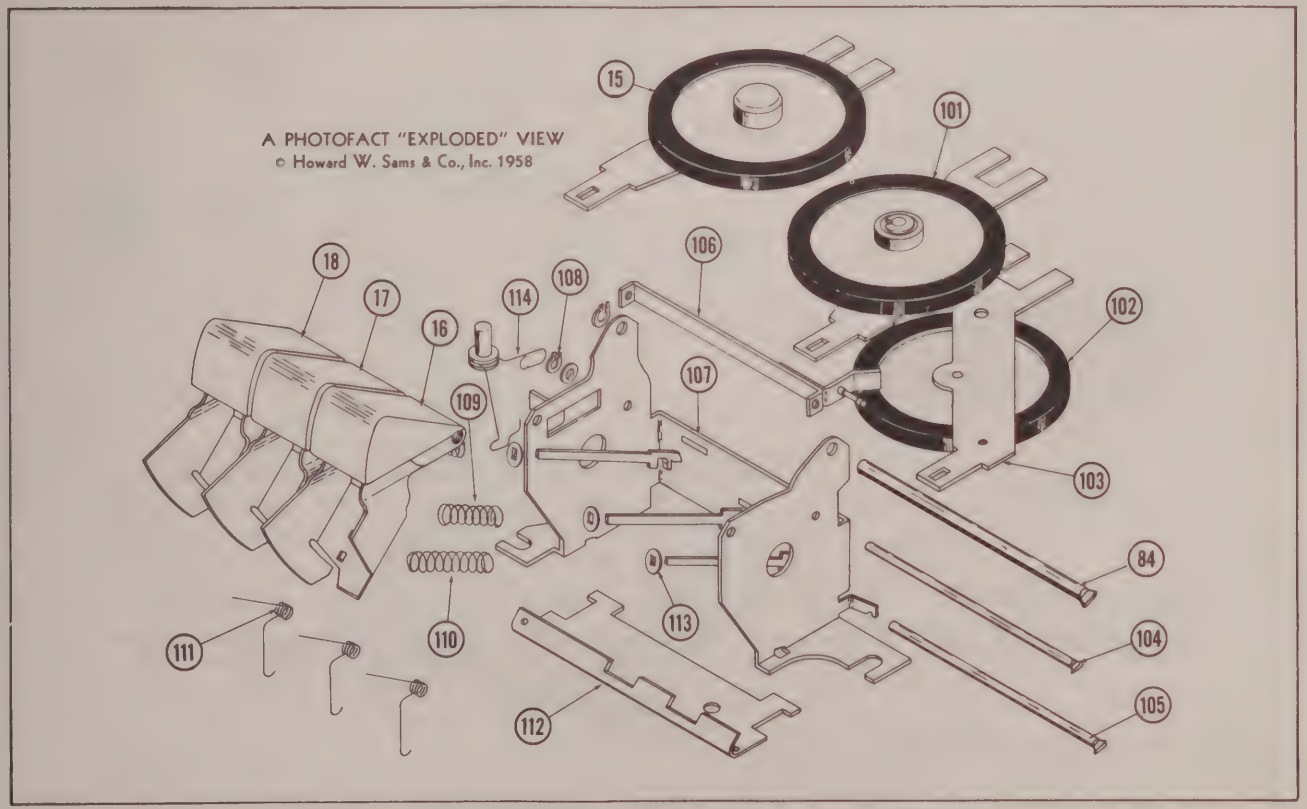
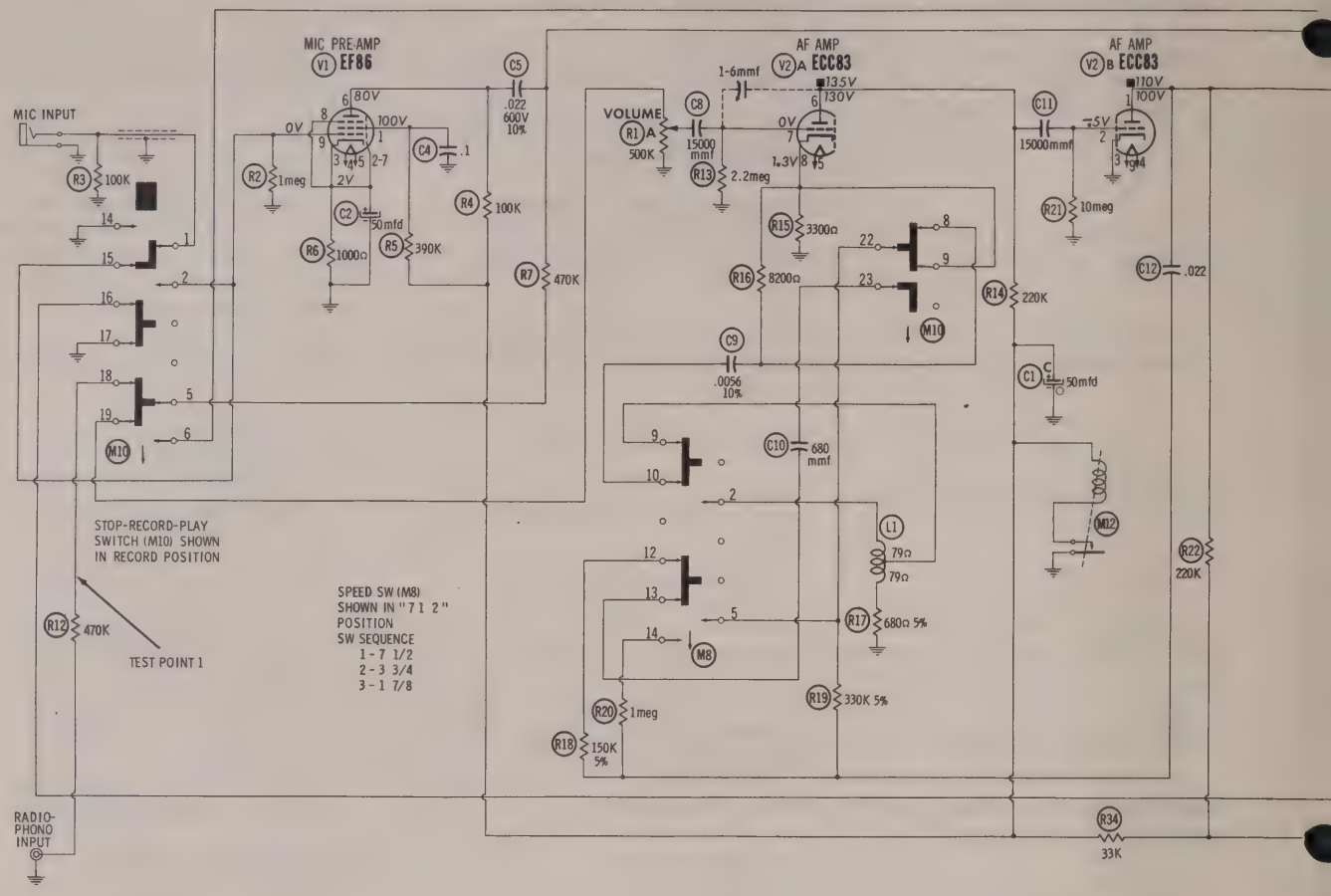
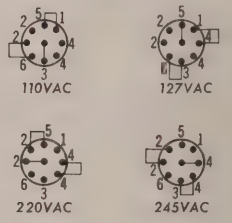


FIG. 4 EXPLODED VIEW OF SPEED CHANGE ASSEMBLY



VOLTAGE ADAPTOR PLUGS



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6267 EF86	†420K	1000Ω	1000Ω	.2Ω	.2Ω	†135K	1000Ω	1000Ω	100K
V2	12AX7 ECC83	†250K	10meg	0Ω	.2Ω	.2Ω	†220K	2.2meg	3300Ω	.2Ω
V3	6DA5 EM81	5meg	0Ω	NC	.2Ω	.2Ω	NC	†470K	NC	†2200Ω
V4	6AQ5 EL90	1meg	560Ω	.2Ω	.2Ω	†700Ω	†12K	1meg		
V5	6X4 EZ90	540Ω	NC	.2Ω	.2Ω	NC	520Ω	¶		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
■ MEASURED IN "RECORD" POSITION.
NC NO CONNECTION.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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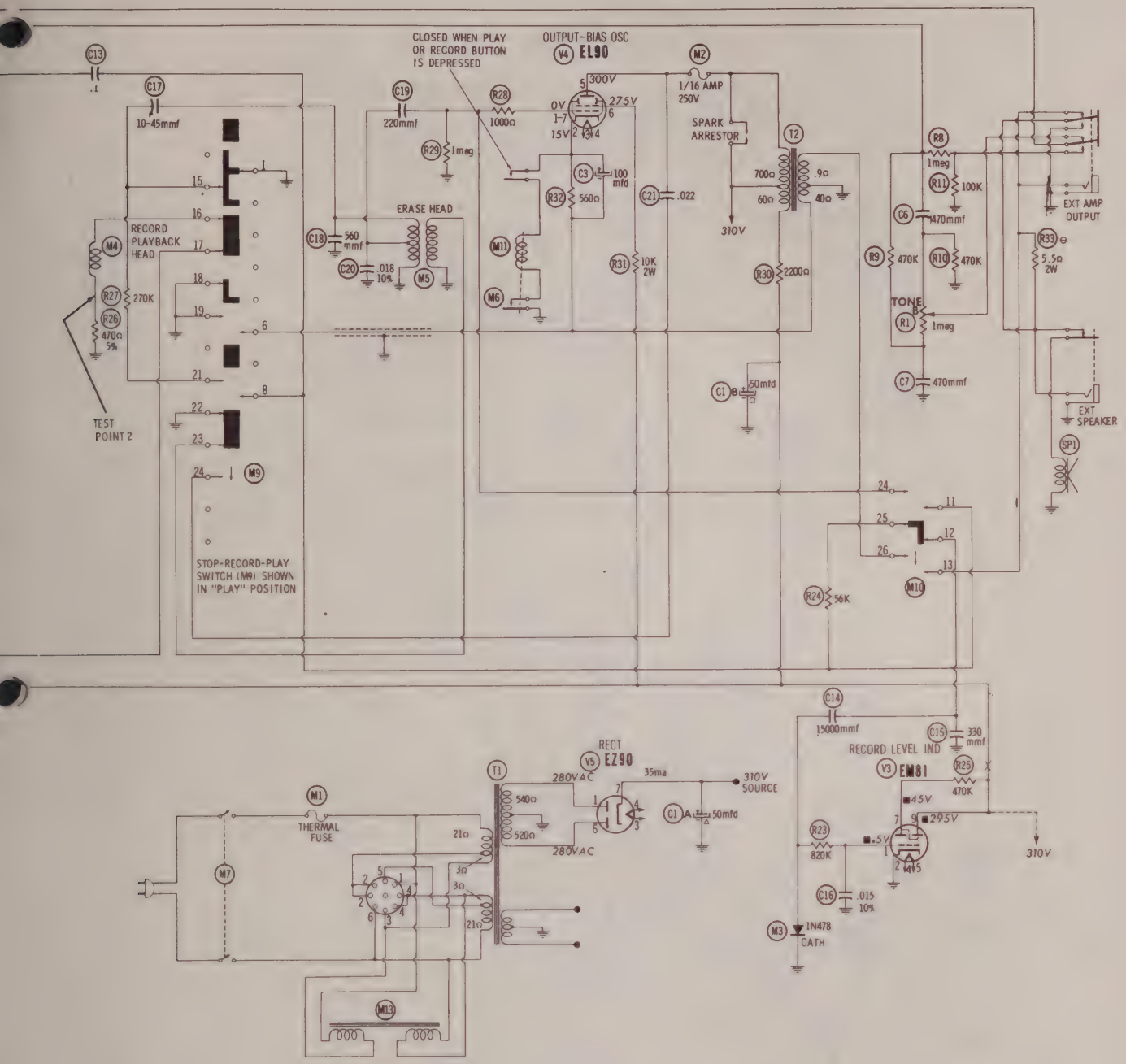

CLOSED WHEN PLAY OR RECORD BUTTON IS DEPRESSED
OUTPUT-BIAS OSC
V4 EL90
M2
1/16 AMP 250V
SPARK ARRESTOR
T2
C13 .1
C17 10-45mmf
C19 220mmf
R28 1000Ω
R29 1meg
C3 100 mfd
R32 560Ω
C21 .022
310V
700Ω
60Ω
.9Ω
40Ω
R8 1meg
R11 100K
C6 470mmf
EXT AMP OUTPUT
R33 5.5Ω 2W
R9 470K
R10 470K
TONE
R1 1meg
C7 470mmf
EXT SPEAKER
SP1
RECORD PLAYBACK HEAD
M4
R27 270K
R26 470Ω 5%
TEST POINT 2
ERASE HEAD
C18 560 mmf
C20 .018 10%
M5
M11
M6
R31 10K 2W
R30 2200Ω
C1B 50mfd
M9
STOP-RECORD-PLAY SWITCH (M9) SHOWN IN "PLAY" POSITION
R24 56K
M10
C14 15000mmf
C15 330 mmf
RECORD LEVEL IND
V3 EM81
R25 470K
RECT
V5 EZ90
T1
35ma
280VAC
540Ω
520Ω
280VAC
310V SOURCE
C1A 50mfd
M1
THERMAL FUSE
M7
21Ω
3Ω
3Ω
21Ω
M13
R23 820K
C16 .015 10%
M3 1N478 CATH
310V

419-11

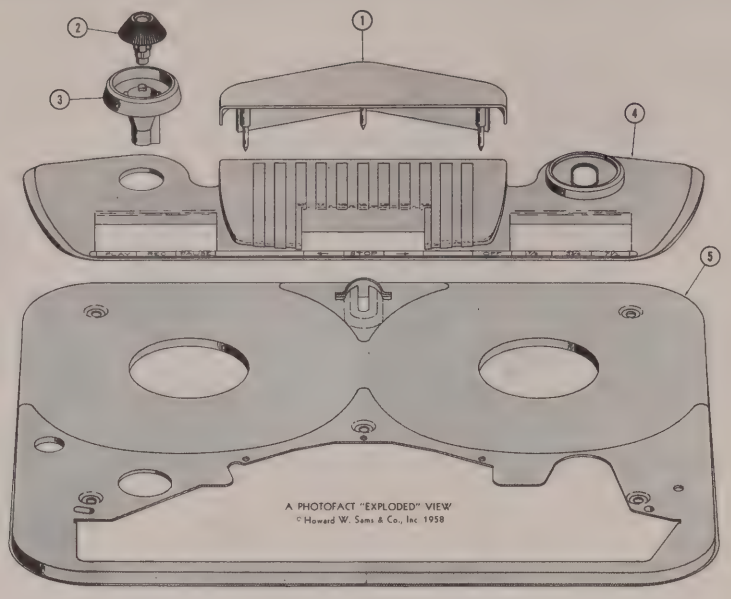


FIG. 5 EXPLODED VIEW OF PARTS ABOVE TOP DRESS PLATE

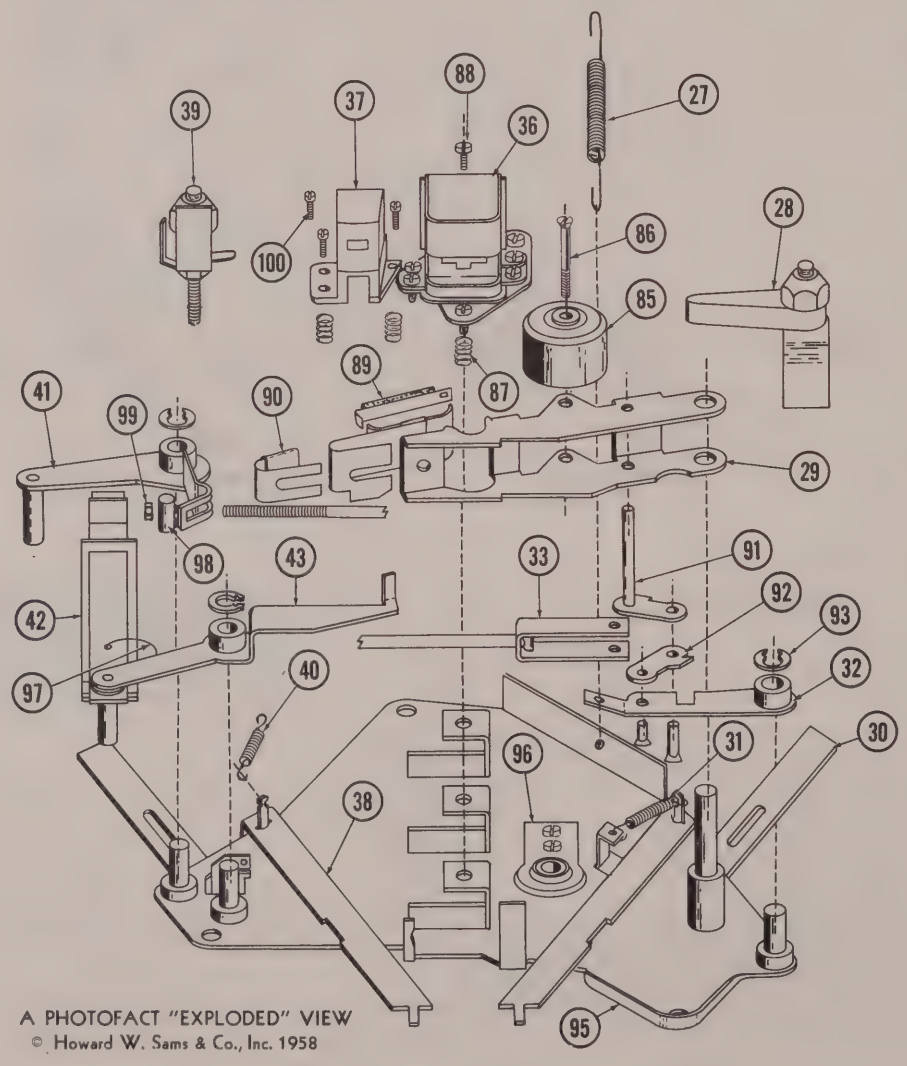


FIG. 6 EXPLODED VIEW OF INTERMEDIATE PLATE ASSEMBLY

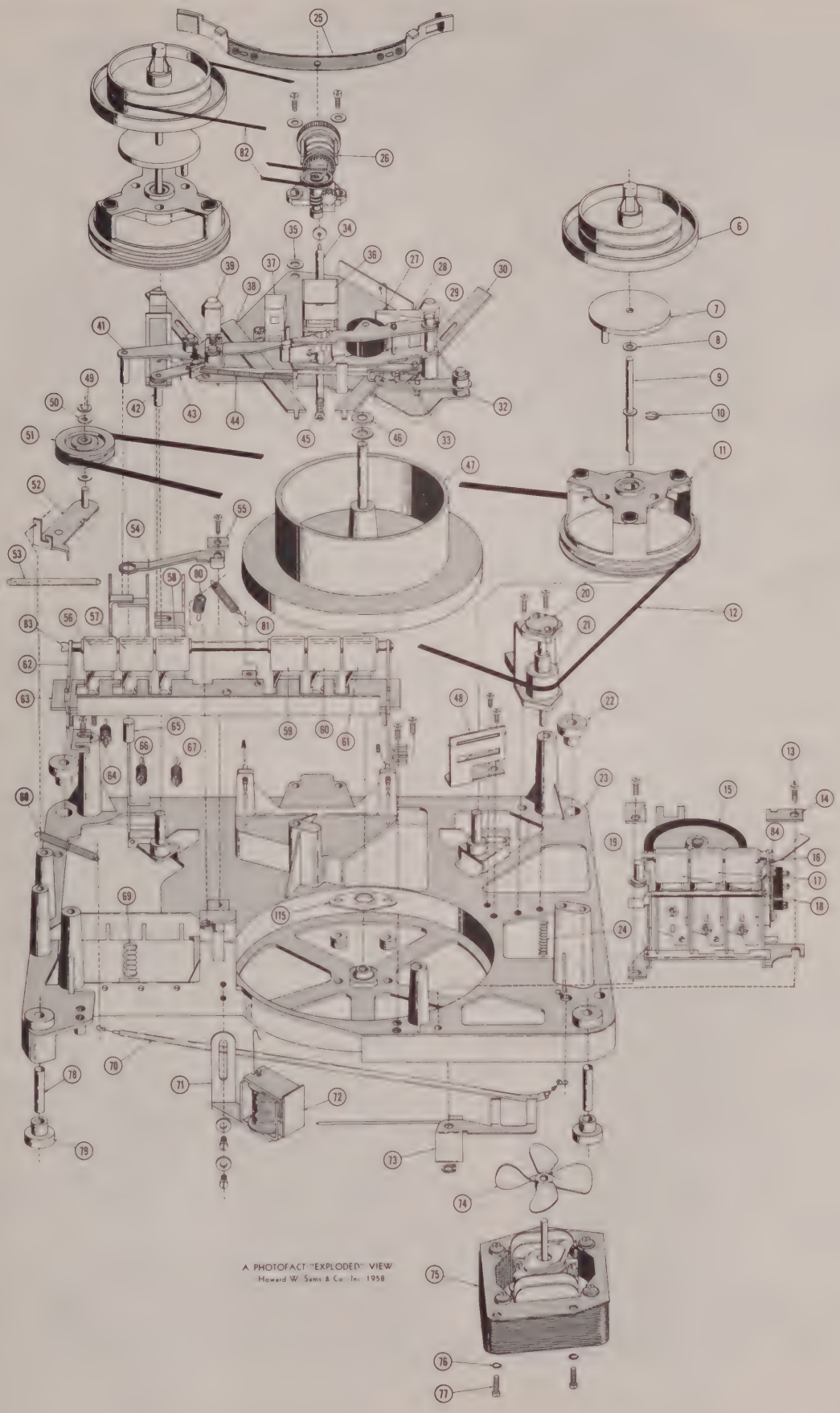
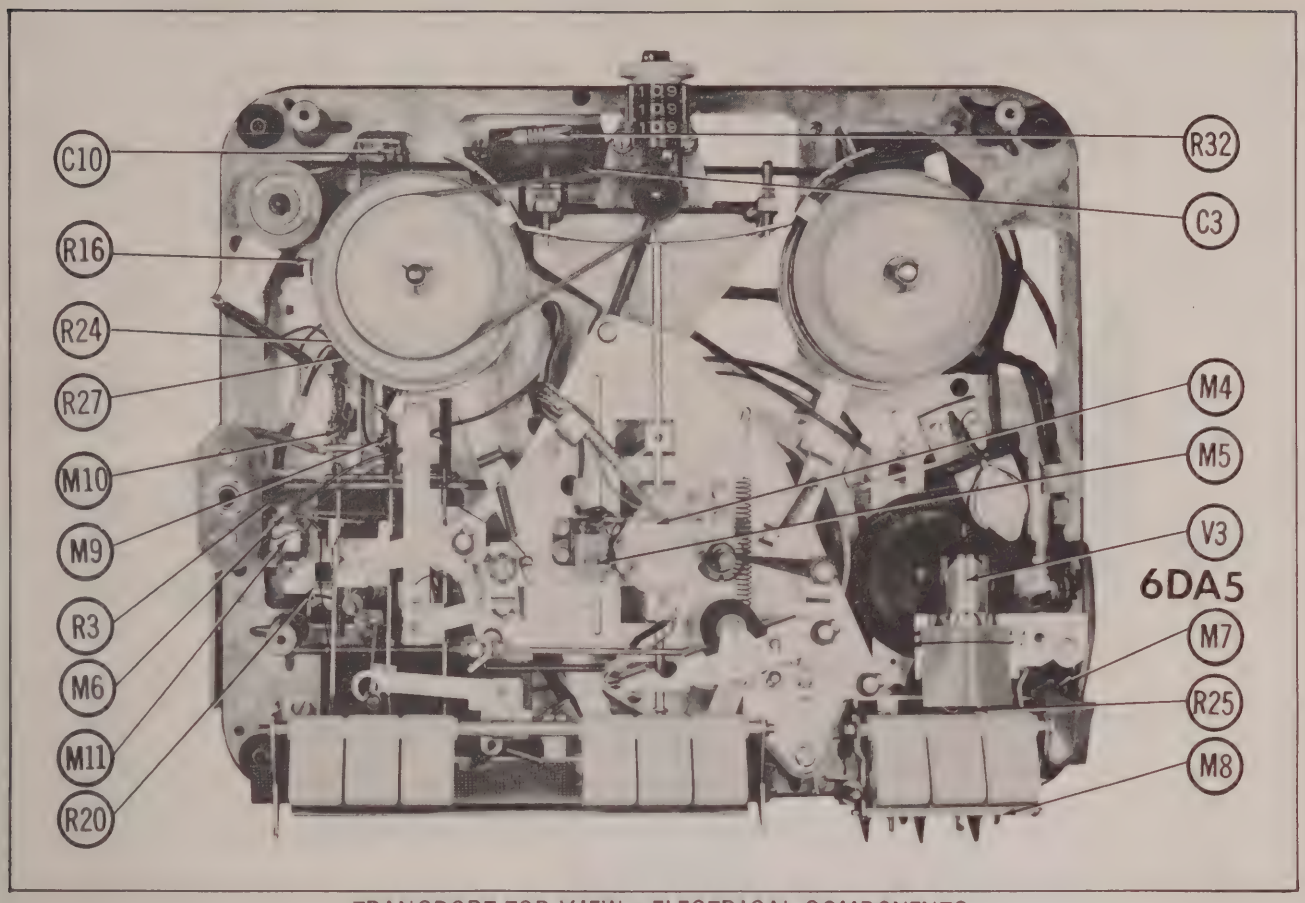


FIG. 7 EXPLODED VIEW OF TRANSPORT MECHANISM

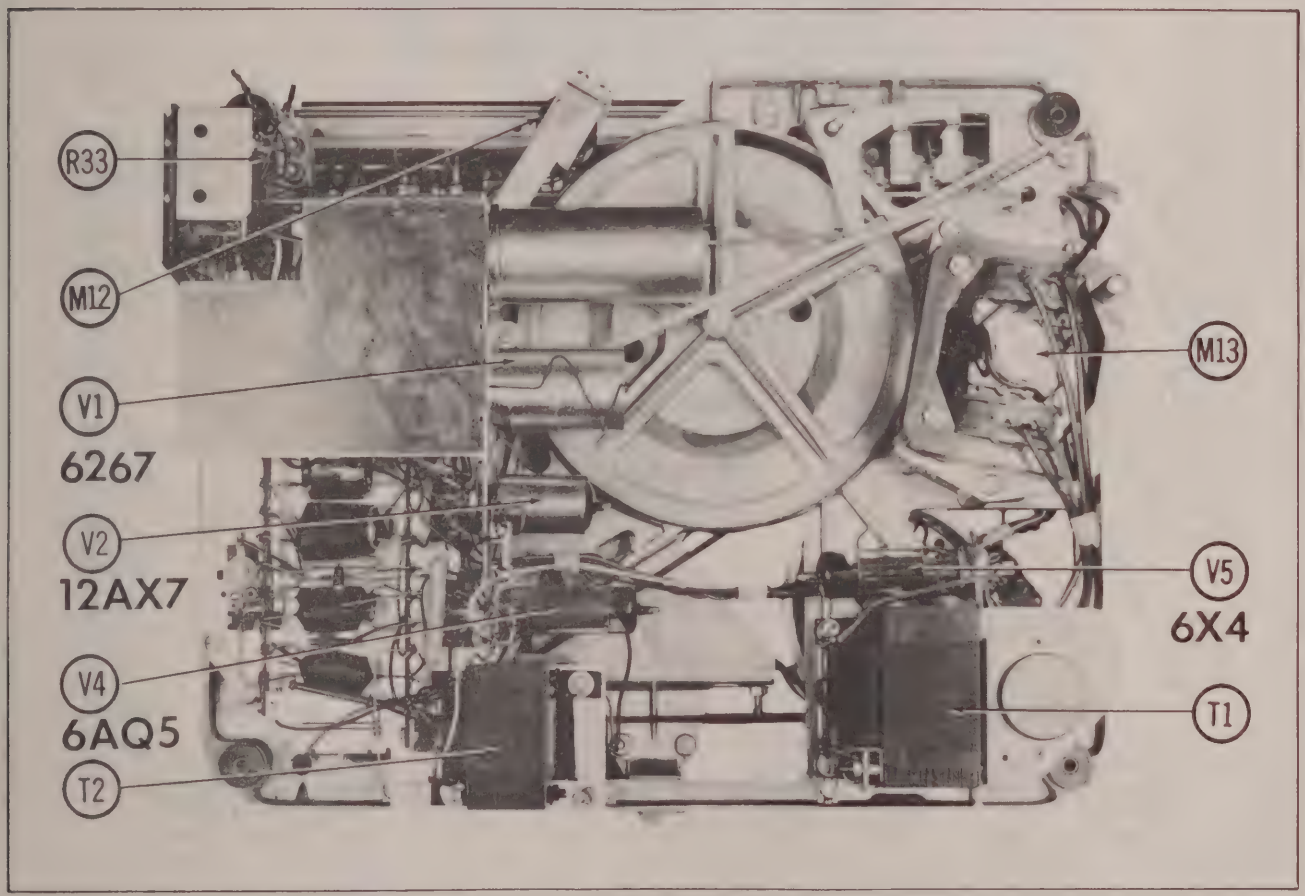
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	WT 250 83	Head Cover
2	WT 260 89	Tone Control Knob
3	WT 260 90	Volume Control Knob
4	WT 250 96	Ornamental Cap
5		Top Dress Plate
6	WT 821 70	Turntable
7	WT 477 41	Clutch Disc
8	A9 868 66	P.V.C. Ring
9	WT 001 18	Spindle
10		"C" Washer
11	WT 881 97	Driving Disc
12	WT 495 22	Drive Belt
13		Speed Control Mounting Screws
14		Washer
15	WT 881 86	Intermediate Wheel
16	WT 26075	7 1/ 2" Per Second Push Button
17	WT 260 75	3 3/ 4" Per Second Push Button
18	WT 260 75	1 7/ 8" Per Second Push Button
19		Stop Button
20	WT 860 79	Bearing Support & Pulley
21	Part of Ref. No. 20	Pulley
22	WT 135 16	Rubber Grommet
23		Base Plate
24	WT 760 04	Motor & Pulley Coupling Spring
25	WT 822 63	Brake Spring Coupling Spring
26	WT 898 15	Index Counter
27	WT 740 64	Tension Spring
28	U 216 99	Tape Guide
29		Pressure Roller Lever
30		Fast Forward Lever
31	49 897 81	Tension Spring
32		Pressure Roller Tension Lever
33		Pressure Roller Actuating Rod
34		Brake Spring Pressure Rod
35		Washer
36	WT 853 60	Record - Playback Head
37	WT 853 61	Erase Head
38		Fast Rewind Lever
39	WT 598 11	End of Tape Switch
40	49 897 81	Tension Spring
41		Play - Record Pivot Lever
42		Pause Brake
43		Pause Pivot Lever
44	C1 204 55	Tension Spring
45		Brake Rod Spring
46		Washer
47	WT 886 03	Flywheel & Spindle
48		Intermediate Wheel Support Bracket
49		"C" Washer
50	WT 458 06	P.V.C. Ring
51	WT 881 87	Idler Wheel
52	WT 864 93	Idler Wheel Bearing
53		Guide Rod
54		Record Lock Guide
55		Washer
56	WT 260 70	Play Push Button
57	WT 260 70	Record Push Button

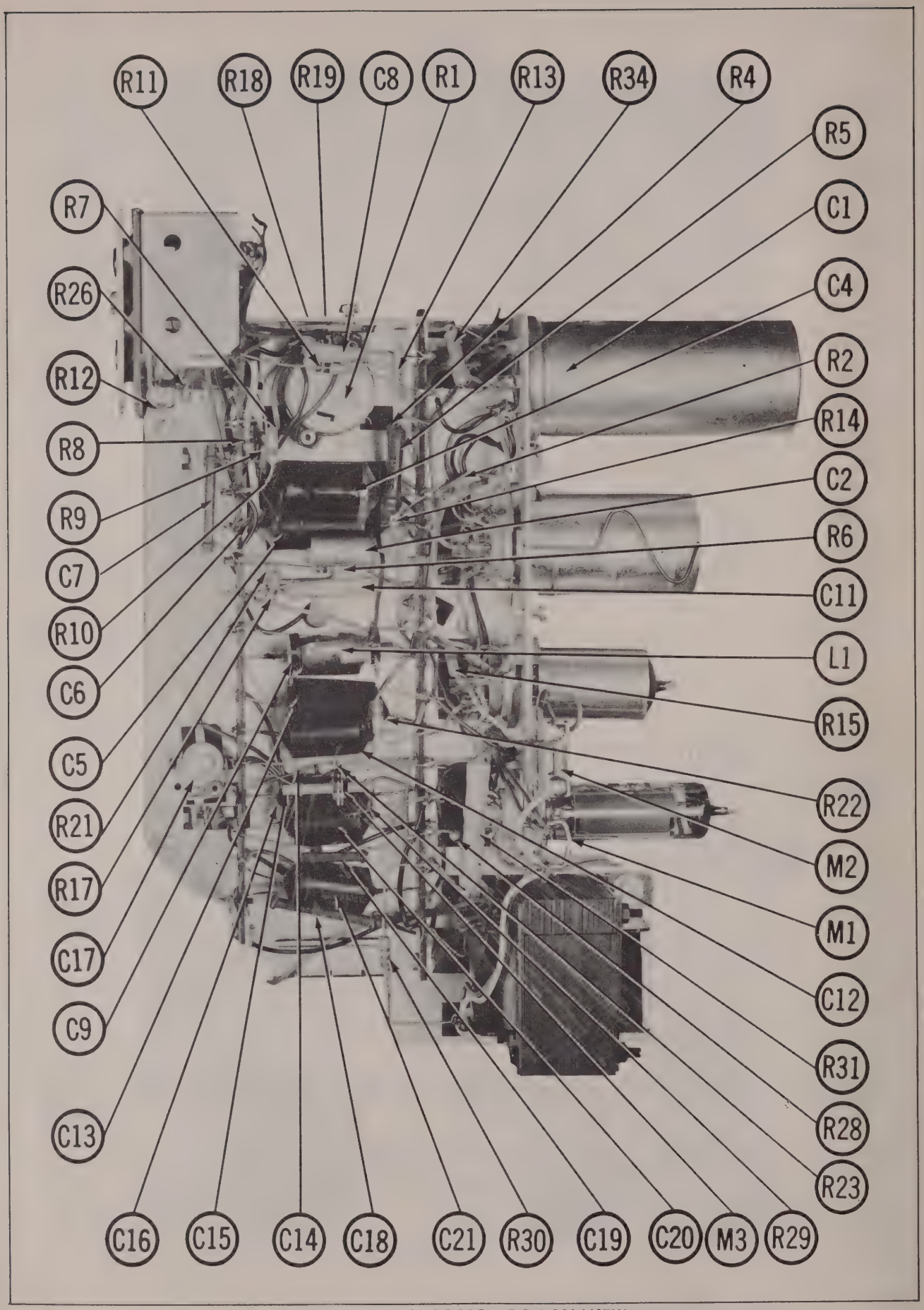
Ref. No.	Part No.	Description
58	WT 260 70	Pause Push Button
59	WT 260 70	Fast Rewind Push Button
60	WT 260 70	Stop Push Button
61	WT 260 70	Fast Forward Push Button
62		Push Button Mounting Frame
63		Push Button Locking Plate
64	WT 740 43	Tension Spring
65		Record Lock
66	WT 740 43	Tension Spring
67	WT 740 43	Tension Spring
68	WT 740 69	Tension Spring
69	C1 751 34	Pressure Ring
70		Bowden Flexible Cable
71		Solenoid Mounting Bracket
72	WT 882 99	Mechanism Release Solenoid
73		Speed Change Lever
74		Motor Fan
75	JW 304 30	Motor
76		Lockwasher
77		Motor Mounting Screws
78		Sleeve
79	WT 135 16	Rubber Grommet
80	49 936 88	Tension Spring
81	WT 740 43	Tension Spring
82	WT 495 21	Index Counter Drive Belt
83		Push Button Mounting Rod
84		Push Button Mounting Rod
85	WT 881 66	Pressure Roller
86	WT 646 12	Pressure Roller Spindle
87	WT 730 44	Pressure Spring
88		Record - Playback Head Mounting Screws
89	WT 021 53	Tension Spring and Pad
90		Tension Spring and Pad
91		Pivot Pin Actuator
92		Pivot Stop
93		"C" Washer
95		Intermediate Plate
96	WT 265 28	Sintered Bearing
97	WT 765 23	Profiled Spring
98		Pressure Roller Adjusting Pin
99		Lock Nut
100		Erase Head Mounting Screws
101	WT 881 86	Intermediate Wheel
102	WT 881 86	Intermediate Wheel
103		Intermediate Wheel Guiding Bracket
104		Push - Button Mounting Rod
105		Push - Button Mounting Rod
106		On - Off Switch Actuating Lever
107		Speed Push - Button Mounting Bracket
108	WT 458 19	P.V.C. Ring
109		Push - Button Return Spring
110		Push - Button Return Spring
111		Tension Spring
112		Speed Selector Locking Plate
113		Washer
114	WT 765 26	Profiled Spring
115	WT45808	Bearing Plate



TRANSPORT TOP VIEW - ELECTRICAL COMPONENTS



TRANSPORT BOTTOM VIEW - ELECTRICAL COMPONENTS



AMPLIFIER CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Mic Preamplifier	6267/EF86
V2	AF Amplifier	12AX7/ECC83
V3	Record Level Indicator	6DA5/EM81
V4	Output-Bias Osc.	6AQ5/EL90
V5	Rectifier	6X4/EZ90

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA NORELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲50	350	A999913/M50	AFH3-29-25	C0234	FP330.9	TMQ-7	T-111	TVL-3639.9
B	■50	350	+50+50				TD-50-450		
C	50	350							
C2	50	12	A999909/B50	XPP-12050	BBR50-25	TC29	TD-50-25	MQ-0150	TE-1133
C3	100	35	A999911/D100	PRS50V100	BR1005	TC3501	TD-100-50	MTH-5010	TVA-1310

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA NORELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.1	400	A999906/100K	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C5	.022	600	A999906/22K						10%
C6	470		A999904/470E	SI 470	D6-471	LT6T47	UC-5347	5GA-T47	
C7	470		A999904/470E	SI 470	D6-471	LT6T47	UC-5347	5GA-T47	
C8	15000		A999906/15K	SI 15000	DD16-153	LT6S15		10HKB-S15	
C9	.0056	400	A999906/5K6				GEM-16256	5BF-D56	10%
C10	680		A999904/680E	SI 680	D6-681	LT6T68	UC-5368	5GA-T68	
C11	15000		A999904/15K	SI 15000	DD16-153	LT6S15		10HKB-S15	
C12	.022	400	A999906/22K	P488N-022	D6-203	CUB4S22	GEM-4122	4TM-S22	
C13	.1	400	A999906/100K	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C14	15000		A999904/15K	SI 15000	DD16-153	LT6S15		10HKB-S15	
C15	330		A999904/330E	SI 330	D6-331	LT6T33	UC-5333	5GA-T33	
C16	.015	125	A999904/15K					2WF-S15	10%
C17	10-45		WS90932/45-10E						
C18	560		A999904/560E	SI 560	D6-561	LT6T56	UC-5356	5GA-T56	
C19	220		A999904/220E	SI 220	D6-221	LT6T22	UC-5322	5GA-T22	
C20	.018	125	A999906/18K					2WF-S18	10%
C21	.022	400	A999906/22K	P488N-022	D6-203	CUB4S22	GEM-4122	4TM-S22	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA NORELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	WT80820					Volume
B	1meg	½						Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	NORELCO PART No.	NOTES
R2	1meg		A999900/1M	
R3	100K		A999900/100K	
R4	100K		A999900/100K	
R5	390K		A999900/390K	
R6	1000Ω		A999900/1K	
R7	470K		A999900/470K	
R8	1meg		A999900/1M	
R9	470K		A999900/470K	
R10	470K		A999900/470K	
R11	100K		A999900/100K	
R12	470K		A999900/470K	
R13	2.2meg		A999900/2M2	
R14	220K		A999900/220K	
R15	3300Ω		A999900/3K3	
R16	8200Ω		A999900/8K2	
R17	680Ω 5%		A999900/680E	
R18	150K 5%		A999900/150K	
R19	330K 5%		A999900/330K	
R20	1meg		A999900/1M	
R21	10meg		A999900/10M	
R22	220K		A999900/220K	
R23	820K		A999900/820K	
R24	56K		A999900/56K	
R25	470K		A999900/470K	
R26	470Ω 5%		A999900/470E	
R27	270K		A999900/270K	
R28	1000Ω		A999900/1K	
R29	1meg		A999900/1M	
R30	2200Ω	(WW)	A999900/2K2	
R31	10K	2	A999900/10K	
R32	560Ω		A999900/560E	
R33	5.5Ω	2		Note 1
R34	33K		A999900/33K	

Note 1. Some versions may use 5.6Ω 2W in this application (Part #B830031B/5E6).

COILS

ITEM No.	USE	REPLACEMENT DATA NORELCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Tone Choke	WT56150					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA NORELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	245V taps @ 220V, 127V 117V @ .73A	540VCT @ .035A	6.3VCT @ 1.8A	WT51079						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA NORELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7800Ω tap @ 1100Ω	96Ω tap @ 4-6Ω	WT51081							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA NORELCO PART No.	QUAM PART No.	NOTES
SP1	5"	PM	4-6Ω	4924287		

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			NORELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	Spring Metal	Rose	0810097					
M2		1/16A 250V	A999974/63	A999974/ 2X20				

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		NORELCO PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N478	OA85	1N38A	1N38A	Tuning Ind. Rectifier (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	NORELCO PART No.	NOTES
M4	Head	WT85360	Record-Playback
M5	Head	WT85361	Erase
M6	Switch	WT59811	End of Tape, Leaf Type
M7	Switch	B159027	Power-On-Off, DPST, Rotary, Snap Type
M8	Switch Segment	WT88582	Speed Selector, Slide Type
M9	Switch Segment	WT88584	Stop, Record, Playback, Slide Type
M10	Switch Segment	WT88583	Stop, Record, Playback, Slide Type
M11	Relay	WT88298	SPST
M12	Solenoid	WT88299	Mechanism Release
M13	Motor	JW30430	
	Jack	WT88802	External Amplifier, Includes DPDT Switch, Lead Type
	Adaptor	WT88561	Voltage Input

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Small Knob	WT26089	Tone
Large Knob	WT26090	Volume
Pushbutton	WT26075	9 Used
Handle	WT83572	Case
Case	WT24179	Less Speaker

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

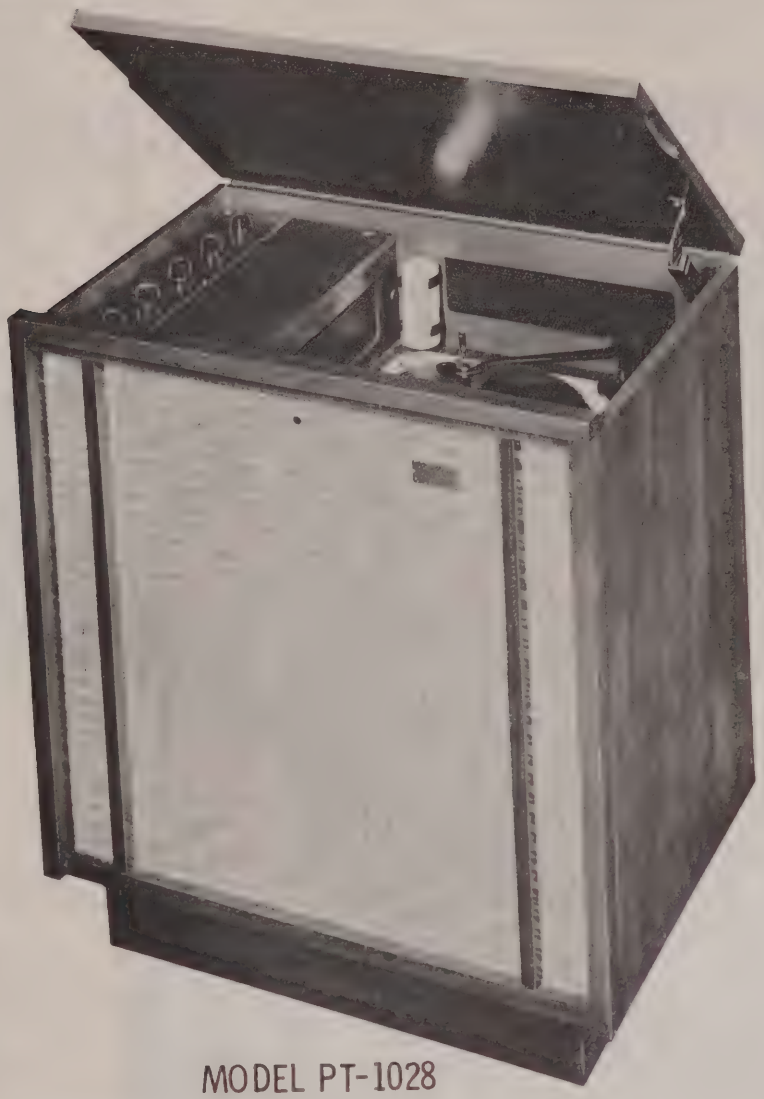
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PILOT MODELS AA-900, PT-1028

PILOT MODELS
AA-900, PT-1028



MODEL PT-1028

PILOT MODELS
AA-900, PT-1028

TRADE NAME	Pilot Models AA-900, PT-1028
MANUFACTURER	Pilot Radio Corp., 37-06 36th St., Long Island City 1, N. Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Six)	Types 12AX7 Phono Preamplifier, 12AX7 1st AF Amplifier, 12AX7 2nd AF Amp.-Phase Inv., (2) EL84 Output, EZ81 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles RATING .62 Amp. @117 Volts AC (63 Watts Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #108-32-SEE GARRARD RC121/4-PHOTOFACT SET 355 FOLDER 4 OR RECORD CHANGER MANUAL RC-10.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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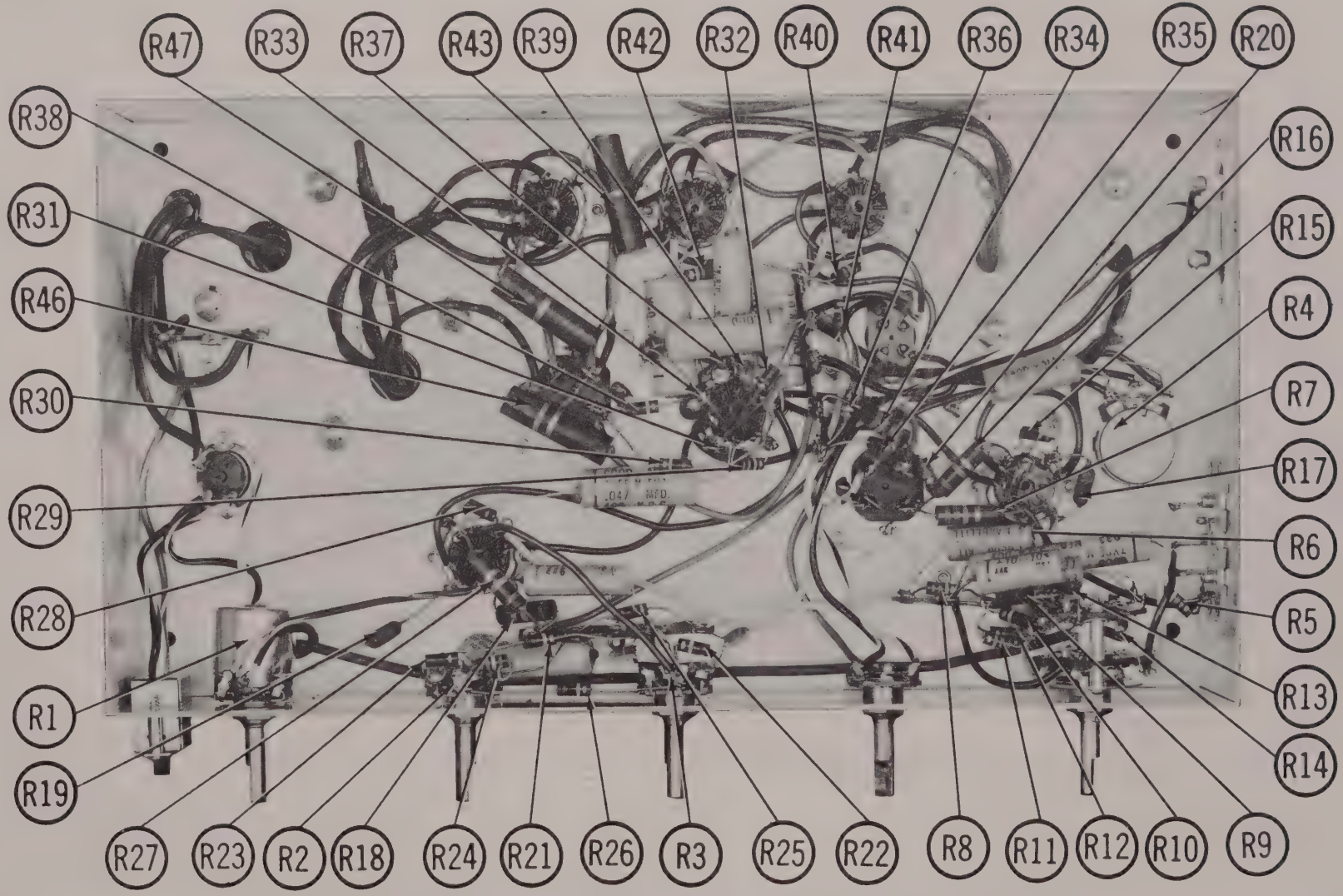


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Phono Pre Amplifier	12AX7
V2	1st AF Amplifier	12AX7
V3	2nd AF Amp. -Phase Inv.	12AX7

ITEM No.	USE	TYPE
V4	Output	EL84/6BQ5 ①
V5	Output	EL84/6BQ5 ①
V6	Rect.	EZ81/6CA4 ①

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	350	24-153	AFH4-14	D0130	FP444	TMQ-12	Q-040	TVL-4763
B	■20	350							
C	20	350							
D	▲20	350							
C2A	▲40	350	24-157	AFH4-50-60	D0540	FP467		T-535	R2692 *
B	■10	350			BBR100-15	TC65		MQ-0225	
C	25	6							
D	▲100	15							
C3	10	25NP	24-160	NP-PRS25V10	BBR20-25	TC45	TD-20-150	MT-0220	R2643 *
					BBR20-25 †	TC45 †	TD-20-150 †	MT-0220 †	

† Connect Negative Leads together.
* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.033	400		P488N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C5	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C6	.0051	400							10%
C7	.033	400							10%
C8	.022	400							10%
C9	1000					IR5D1		MS-21	10%
C10	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C11	.033	400		P488N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C12	50			N750-DI50	DTN-50	C10Q5U			10% N750
C13	1000					1R5D12		MS-212	10%
C14	3.3			NPO-SI3.3	TCZ-3R3	CTA6V33C	ZT-5533	5TCCB-V33	
C15	1200					1R5D12		MS-212	10%
C16	.047	400							10%
C17	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	150			N750-DI50	DTN-150	C10T15U		5TCU-T15	10% N750
C19	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	①
C20	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C21	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C22	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C23	4.0	50							
C24	.01	400		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C25	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	

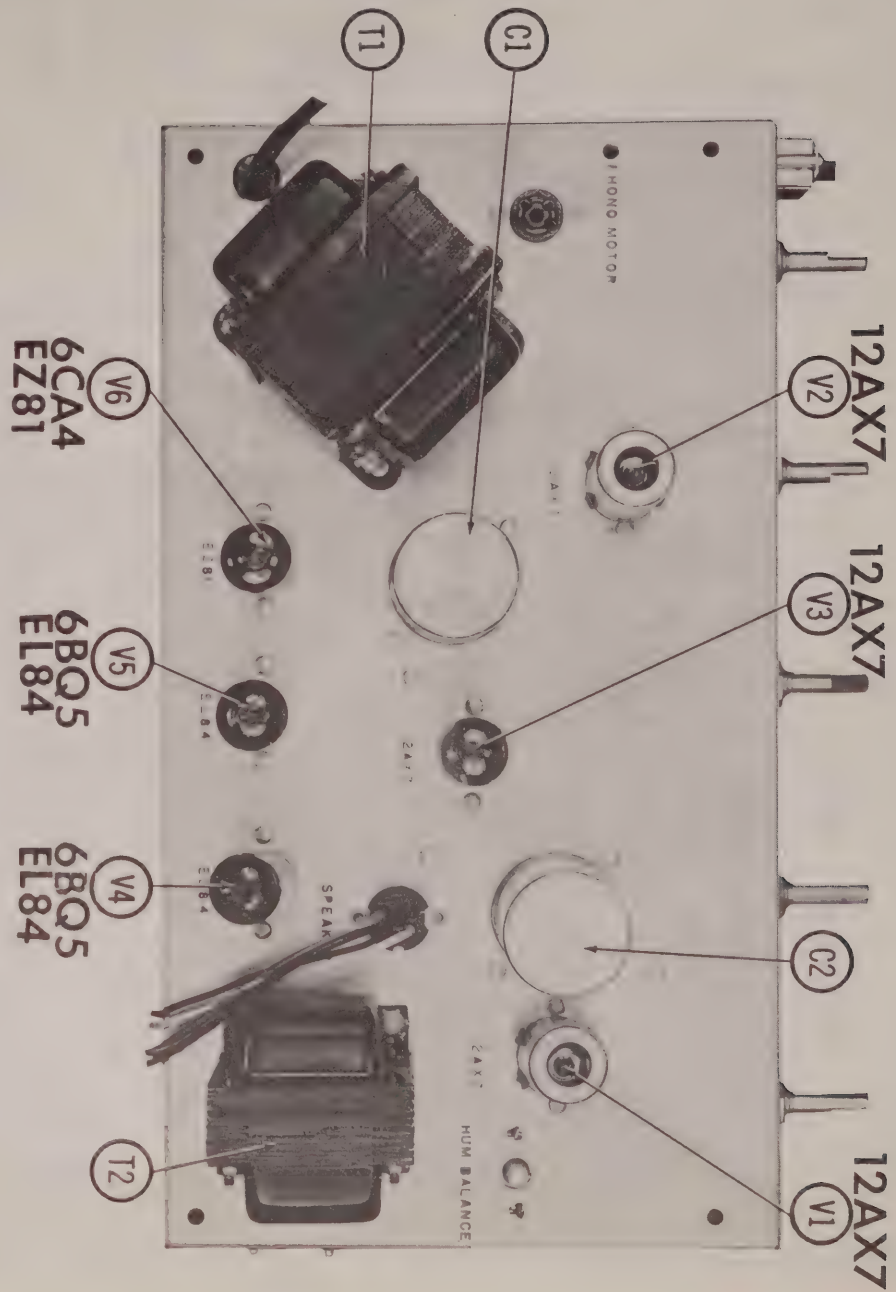
① Not used in model AA-900.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PILOT PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	36-67	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	5meg	½	37-35	B-87	A47-5meg-S	Q11-141	U67	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	5meg	½	37-35	B-87	A47-5meg-S	Q11-141	U67	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	25K	½	39-44	AB-26	A47-25K-S	B11-120	TA253L	Hum Balance
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PILOT PART No.	NOTES
R5	47K 5%			
R6	2.2meg			
R7	68K	1		
R8	330K			
R9	8200Ω 5%			
R10	220K 5%			
R11	68K 5%			
R12	82K 5%			
R13	100K 5%			
R14	82K 5%			
R15	2.2meg			
R16	82K	1		
R17	3300Ω	1		
R18	82K	1		
R19	2200Ω	1		
R20	15K			
R21	220K 5%			
R22	220K			
R23	1.5meg			①
R24	39K			
R25	4700Ω 5%			
R26	100K 5%			
R27	82K	1		
R28	2200Ω			
R29	330K			
R30	100K 5%			
R31	2200Ω			
R32	15K			②
R33	15K			③
R34	27K	1		
R35	220K			
R36	39K			
R37	1meg			
R38	100K 5%			
R39	1500Ω			
R40	270K 5%			
R41	12K 5%			
R42	270K			
R43	150Ω 5%	2		
R44	6.8Ω	1		
R45	4.7Ω	1		
R46	22K	2		
R47	100Ω	2		

① Model AA-900 uses 680K in this application.
② Model AA-900 uses 6800Ω in this application
③ Not used in Model AA-900.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .62A	550VCT ⓐ .100A	6.3V ⓐ 3.3A	55-60	P9214	P3148		PC8420	26R31U	R-12A ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7200Ω CT	6-8Ω	56-53	Z1405①	A-3128①		A-3304①	24S58①	S-21A①	① Drill new mounting holes.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PILOT PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	12JB-27 ①	12A6A	① Alternate Part No. #41-43
SP2	6½"	PM	3-4Ω	41-40A	6A21	
SP3	3½"	PM	6-8Ω	41-44	3A15TZ7.4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA PILOT PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	RPX052A					

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

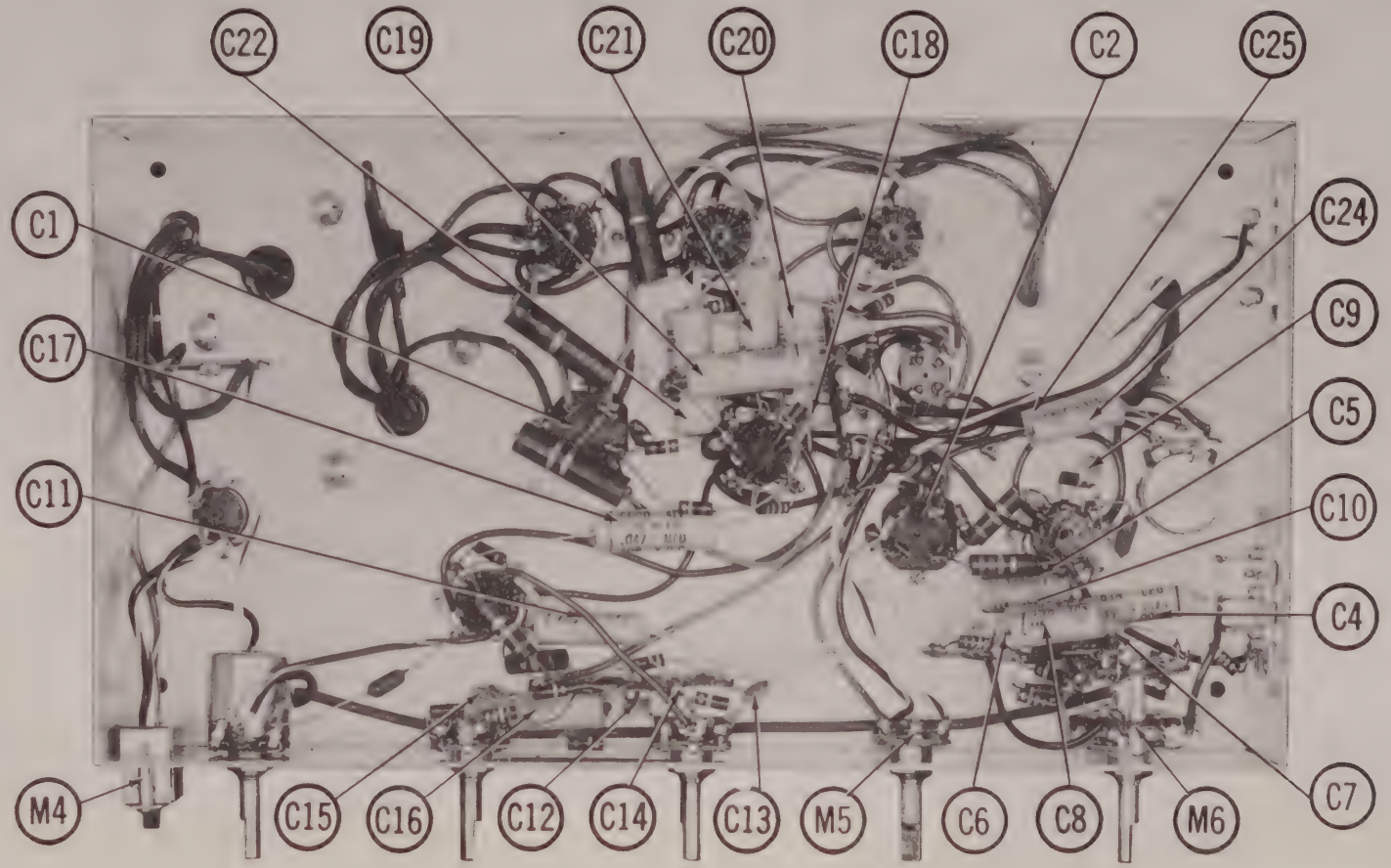
ITEM No.	REPLACEMENT DATA PILOT PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	RPJ03S (78) RPJ01D (LP)	† G-3 or ♦ G-3D † G-1 or ♦ G-1D	† W-68S or ♦ W-68D † W-68MGS or ♦ W-68MED	† Jewel ♦ Diamond

MISCELLANEOUS

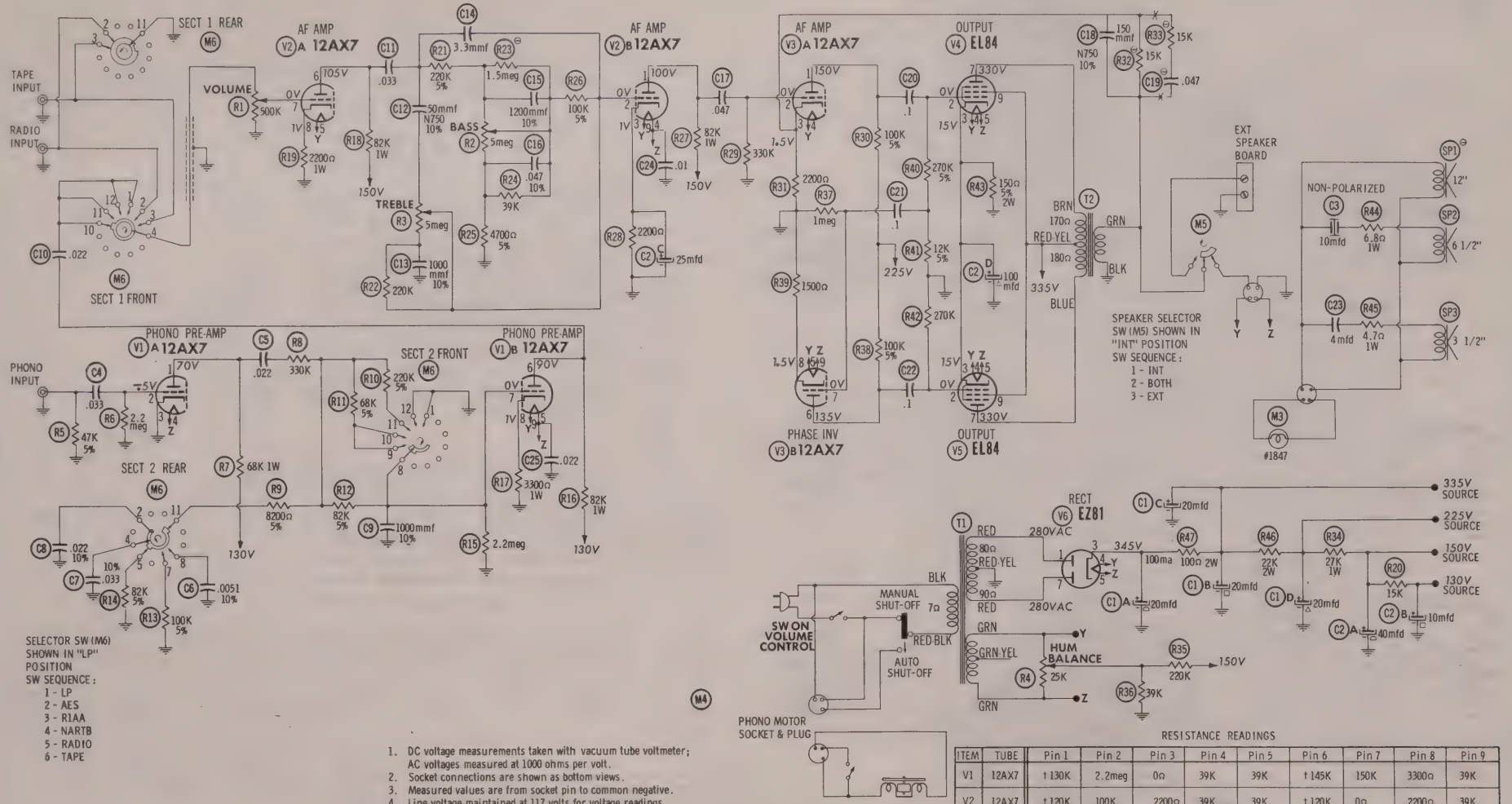
ITEM No.	PART NAME	PILOT PART No.	NOTES
M3	Lamp		#1847
M4	Switch	101-29	Auto-Manual Shutoff, SPDT, Slide Type
M5	Switch	100-119	Speaker, Rotary, Wafer Type
M6	Switch	100-118	Input Selector, Rotary, Wafer Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



SELECTOR SW (M6) SHOWN IN "LP" POSITION
SW SEQUENCE:
1 - LP
2 - AES
3 - RIAA
4 - NARTB
5 - RADIO
6 - TAPE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†130K	2.2meg	0Ω	39K	39K	†145K	150K	3300Ω	39K
V2	12AX7	†120K	100K	2200Ω	39K	39K	†120K	0Ω	2200Ω	39K
V3	12AX7	†120K	330K	2200Ω	39K	39K	†120K	1meg	1500Ω	39K
V4	EL84	NC	280K	150Ω	39K	39K	NC	†280Ω	NC	†100Ω
V5	EL84	NC	270K	150Ω	39K	39K	NC	†270Ω	NC	†100Ω
V6	6CA4 EZ81	82Ω	NC	¶	39K	39K	NC	91Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 3 OF V6.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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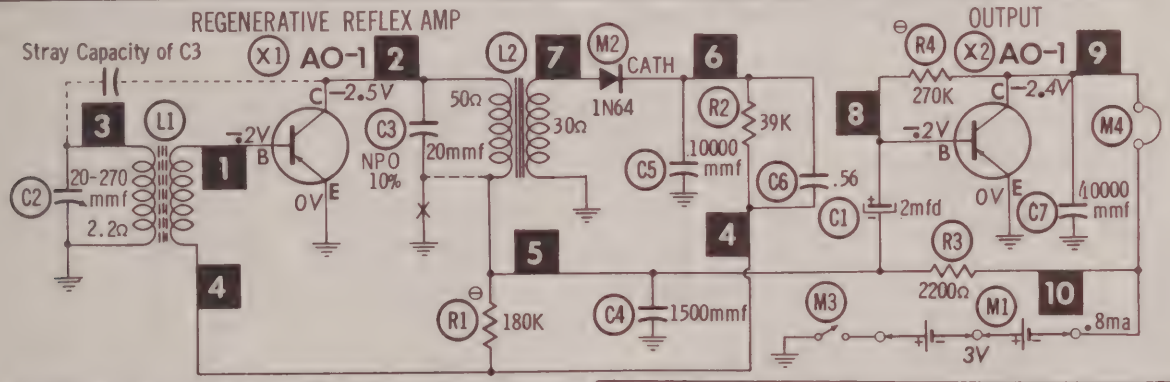
PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

REGENCY
MODEL XR-2A

REGENCY
MODEL XR-2A

TRADE NAME	Regency Model XR-2A		
MANUFACTURER	Regency Div., I.D.E.A., Inc., 7900 Pendleton Pike, Indianapolis 26, Indiana		
TYPE SET	Battery Operated Portable AM Transistorized Receiver		
POWER SUPPLY	3 Volts DC	RATING	0.8MA @ 3 Volts DC



⊖ SEE PARTS LIST FOR ALTERNATE VALUE

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE*

*TRADE MARK

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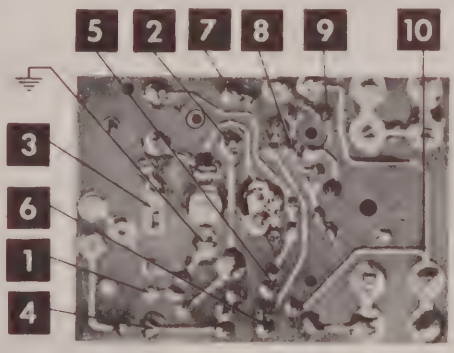
ALIGNMENT INSTRUCTIONS

1. Set C2 for maximum capacity. Rotate L2 for maximum regeneration (below oscillation).
2. Set C2 for minimum capacity. Dress C3 for maximum regeneration (below oscillation).
3. Repeat steps 1 and 2 for maximum gain and sensitivity without oscillation through out the tuning range.



A Howard W. Sams CIRCUITRACE* Photo

*TRADE MARK

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SET 419 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	AO-1	Regenerative Reflex Amp.			2N631		PNP
X2	AO-1	Output					PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	REGENCY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	2	3	300-473-11	XPP-3002	NL2-3	TT6X2	ML2-6		TE-1051

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	REGENCY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	20-270		300-670						
C3	20		100-772-10	NPO-DI 20	DTZ-20	C10Q2C	ZT-542	5TCC-Q2	NPO 10%
C4	1500		101-142-1	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C5	10000		101-142-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C6	.56								
C7	10000		101-142-2	BPD-01	DD-103	BYA6S1	DC511	5HK-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REGENCY PART No.	NOTES
	OHMS	WATT		
R1	180K			Note 1
R2	39K			

ITEM No.	RATING		REGENCY PART No.	NOTES
	OHMS	WATT		
R3	2200Ω			
R4	270K			Note 2

Note 1. Some versions use 68K or 100K in this application.
Note 2. Some versions use 100K or 180K in this application.

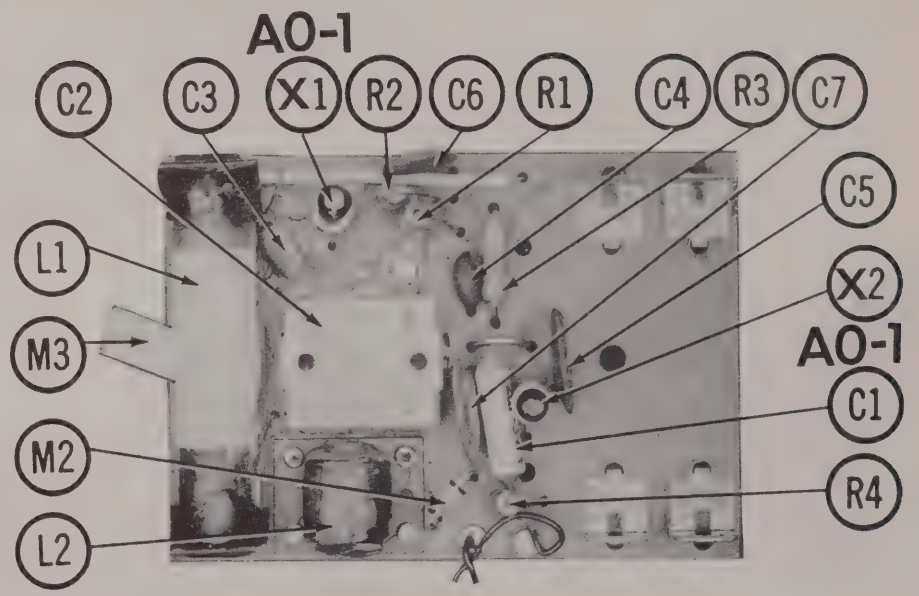
COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		REGENCY PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	101-032					
L2	RF Trans.	101-028					

BATTERIES

ITEM No.	VOLTAGE	REGENCY PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	3V			7		912			Two used

CHASSIS—TOP VIEW



CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		REGENCY PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N64	1N64	1N64	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	REGENCY PART No.	NOTES
M3	Switch	101-045	On-Off, Lever Type
M4	Earphone	101-079	
	Printed Board	500-401	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	300-689	Tuning
Case	600-085	(Both Halves)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

WATTERSON MODEL 601

WATTERSON MODEL 601

WATTERSON MODEL 601

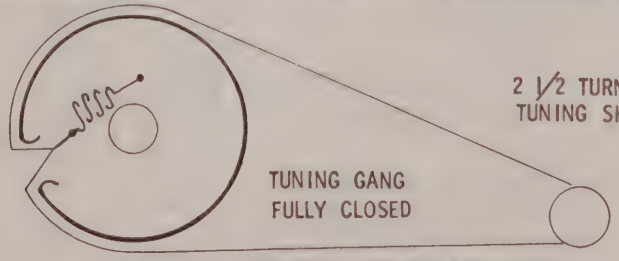
TRADE NAME	Watterson Model 601
MANUFACTURER	J. W. Davis Co., 9212 Denton Drive, Box 35313, Dallas, Texas
TYPE SET	Battery Operated AM Transistorized Receiver
POWER SUPPLY	12Volts DC
TUNING RANGE—BROADCAST	535-1725KC
RATING	11.3MA @ 12Volts DC (No Signal, Min. Volume) 11.8MA @ 12Volts DC (Signal Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to base of 2N252 (X1). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4, A5.	Adjust for maximum deflection.
2.		Loop	1700KC	1700KC	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat Steps 2 and 3.



DIAL CORD STRINGING

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SET 419 FOLDER 14

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N252	Converter			2N485		
X2	2N253	1st IF Amplifier	CBS-2N438				
X3	2N254	2nd IF Amplifier	CBS-2N439				
X4	2N238	Driver	CBS-2N180	2N217	CK872		
X5	2N291	Output	CBS-2N180	2N270	CK878		
X6	2N291	Output	CBS-2N180	2N270	CK878		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Watterson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	25							R2636*
B	50	25							
C	50	6							
D	100	25		SRE6V5	BBR5-6	TT6X5	ML5-6	MMT-605	TE-1084
C2	5	6							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Watterson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C4	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C5	3.3			NP0-SI3.3	TCZ-3R3	CTA6V33C	ZT-5533	5TCCB-V33	
C6	50000			BPD-05	DF-503			5HK-S5	
C7	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C8	50000			BPD-05	DF-503			5HK-S5	
C9	2000			BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C10	3.3			NP0-SI3.3	TCZ-3R3	CTA6V33C	ZT-5533	5TCCB-V33	
C11	50000			BPD-05	DF-503			5HK-S5	
C12	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C13	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C14	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C15	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Watterson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2500Ω	½	110-26			Q13-111		Volume
B	Switch					76-1		

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

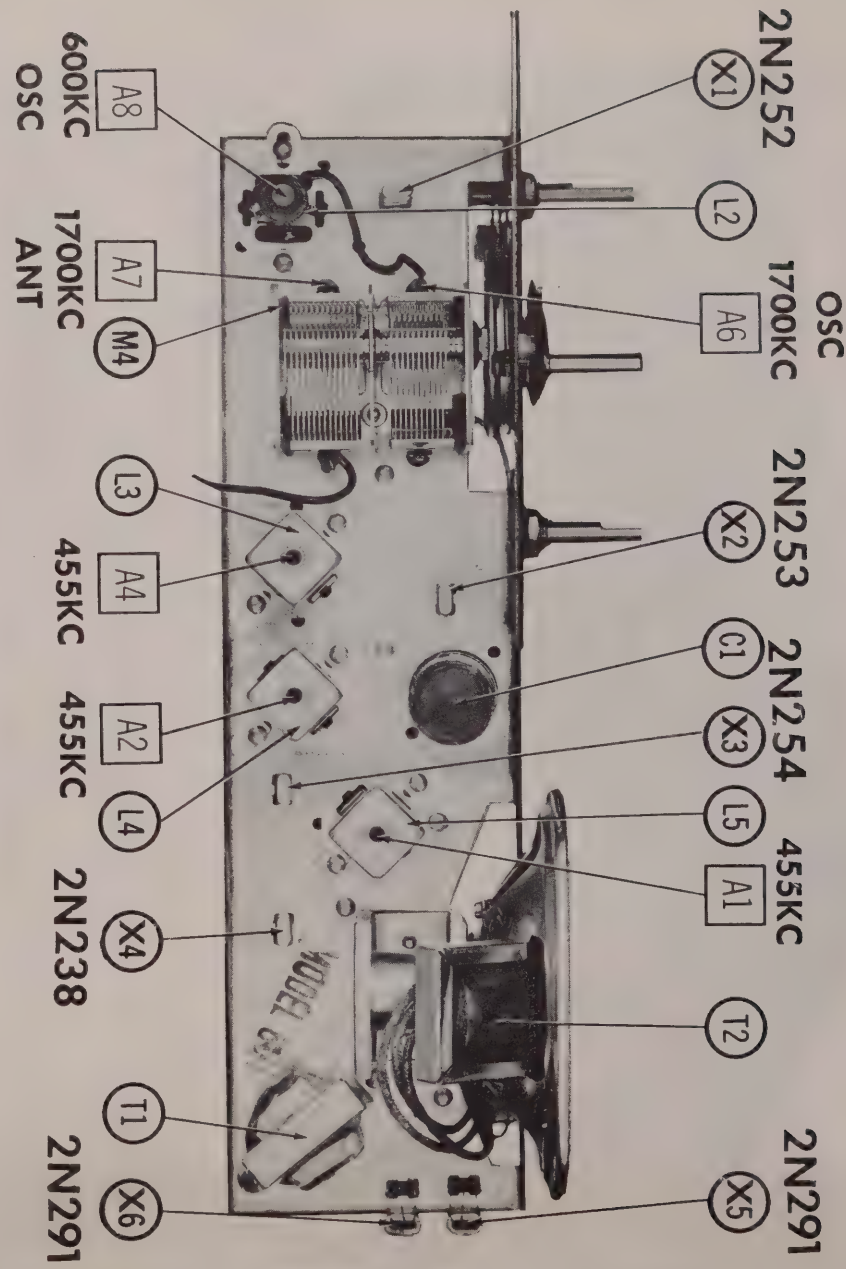
ITEM No.	RATING		Watterson PART No.	NOTES
	OHMS	WATT		
R2	47K			
R3	8200Ω			
R4	3300Ω			
R5	82K			
R6	2200Ω			
R7	220Ω			
R8	220Ω			
R9	15K			
R10	2200Ω			
R11	1000Ω			
R12	1000Ω			
R13	220Ω			

Note 1. Some versions may use 33Ω in this application.

ITEM No.	RATING		Watterson PART No.	NOTES
	OHMS	WATT		
R14	2200Ω			
R15	12K			
R16	1000Ω			
R17	10K			
R18	47Ω			Note 1
R19	15K			
R20	15K			
R21	10Ω			
R22	220Ω			
R23	1500Ω			Note 2
R24	1000Ω			

Note 2. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Watterson PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	3D70					
L2	Osc. Coil	3D69		BC-403			
L3	1st IF	4661					
L4	2nd IF	4661					
L5	3rd IF	4662					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Watterson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5:	1	12D16							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Watterson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	600Ω CT	3-4Ω	Part of SP1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Watterson PART No.	QUAM PART No.	
SP1	4½"	P M	3-4Ω	18D25	5A15	Includes T2

BATTERIES

ITEM No.	VOLTAGE	Watterson PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1½V			2R		950		M-13R	Eight Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Watterson PART No.	CBS PART No.	SYLVANIA PART No.	
M2	CK-706		1N60	1N60	Detector
M3	CK-706		1N60	1N60	AVC Rectifier

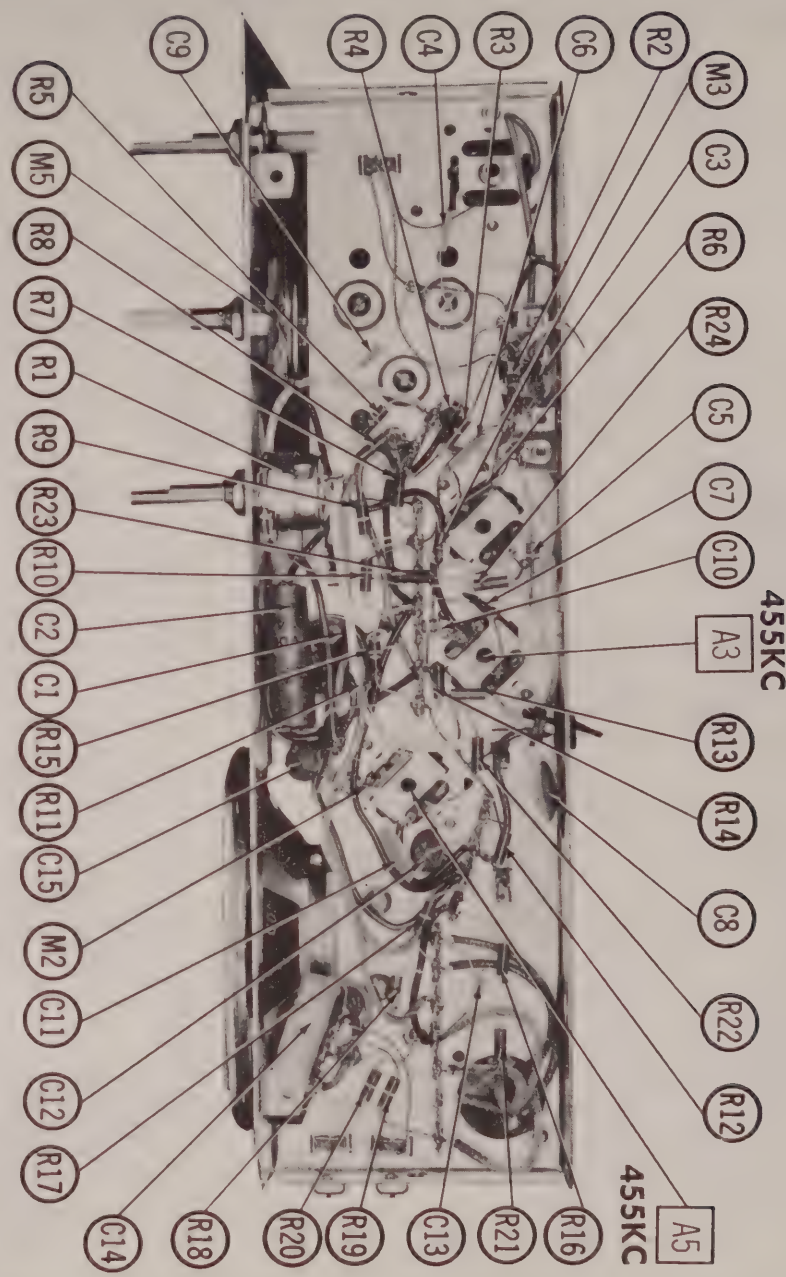
MISCELLANEOUS

ITEM No.	PART NAME	Watterson PART No.	NOTES
M4	Tuning Cap.	7D12	2 Gang (Ant. 40-493mmf, Osc. 41-222mmf)
M5	Switch		Tone, 2-Position Single Rotary Wafer Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

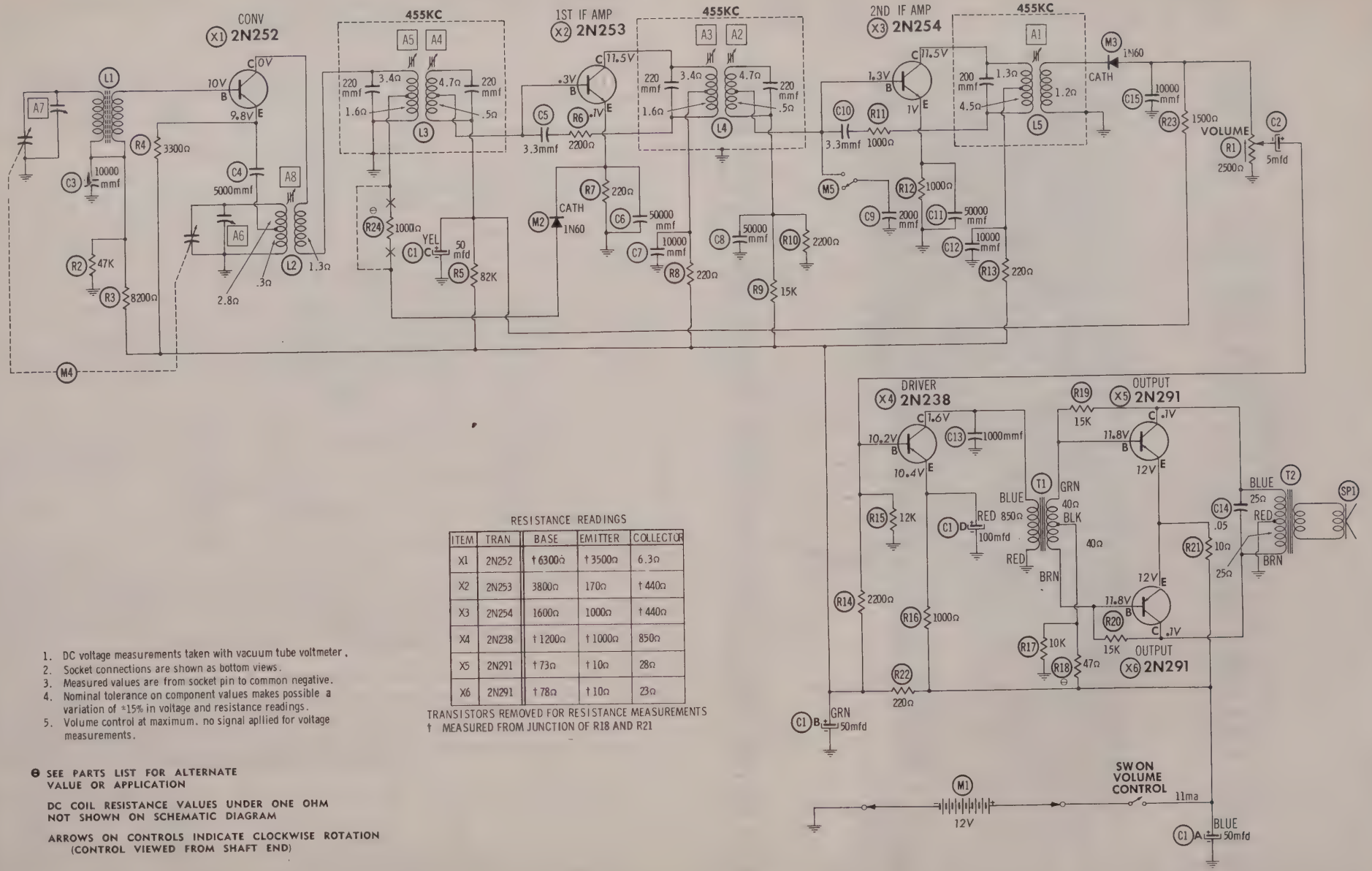
CHASSIS—BOTTOM VIEW



FOLDER 14

WATTERSON MODEL 601

WATTERSON MODEL 601



RESISTANCE READINGS

ITEM	TRAN	BASE	EMITTER	COLLECTOR
X1	2N252	†6300Ω	†3500Ω	6.3Ω
X2	2N253	3800Ω	170Ω	†440Ω
X3	2N254	1600Ω	1000Ω	†440Ω
X4	2N238	†1200Ω	†1000Ω	850Ω
X5	2N291	†73Ω	†10Ω	28Ω
X6	2N291	†78Ω	†10Ω	23Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS
† MEASURED FROM JUNCTION OF R18 AND R21

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SCHEMATIC NOTES

Numbers and letters inside hexagons indicate alignment points.

Fixed resistor values shown in ohms ± 10% tolerance, ½ watt; capacitor values shown in micromicrofarads ± 20% unless otherwise specified.

NOTE: K = x 1000, MEG = x 1,000,000, MF = microfarad.

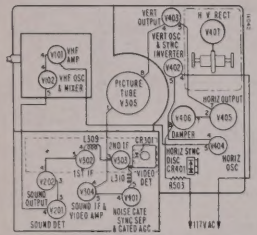
VOLTAGES AND WAVEFORMS

- Isolation transformer used. Line Voltage: 117 volts AC.
- Set Channel Selector on an unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb Horizontal Lock adjustment.
- Antenna disconnected and terminals shorted together.
- DC voltages measured with VTVM between tube socket terminals and chassis, unless otherwise indicated.
- Voltages marked (*) will vary widely with control settings.
- Waveforms taken with transmitted signal input to television chassis.
- For waveform measurement, all controls set for normal picture.
- Peak-to-peak voltages may vary slightly from those shown.

VHF TUNER 94E119-6

COIL VIEW

PRINTED WIRING BOARD A5770-4



TUBE COMPLEMENTS

V101	3BC5	V401	3BU8
V102	5J6	V402	6CG7
V201	3DT6	V403	12DB5
V202	12CU5	V404	6CG7
V302	3DK6	V405	12DQ6A
V303	3DK6	V406	12AX4GTA
V304	6AW8A	V407	1B3GT
V305	17BZP4		
		CR401	93B5-4
CR301	1N87		(Dual Selenium Diode)
	(Crystal Diode)		

RESISTORS

Sym.	Description	Part No.
R208	1 megohm, Volume control (includes switch S501)	75D 1-93
R324	25,000 ohms, Contrast control	75D 20-98
R325	100,000 ohms, Brightness control	75D 20-115
R419	200,000 ohms, Vertical Hold control	75D 20-97
R424	1.5 megohms, Height control	75D 20-104
R426	500 ohms, Vert. Lin. control	75D 20-100
R432	3.8 ohms (measured when cold), thermistor	61A 27
R501	5 ohms, 5 watts, fusible	61A 28-3
R503	35 ohms, 5 watts, candohm	61B 3-32

CAPACITORS

Sym.	Description	Part No.
C202	4.5 mmf, 450 volts, 5%, composition	65B 40-45
C204	82 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-98
C207	18 mmf, 500 volts, 5%, cer. disc, N220 temp. coeff.	65D 10-140
C209	.047 mf, 200 volts, upright paper	64B 16-55
C215	40 mf, 200 volts, electrolytic	67A 25-2
C216A	60 mf, 200 volts	
C216B	5 mf, 200 volts	
C216C	20 mf, 200 volts } electrolytic	67D 15-307
C216D	50 mf, 50 volts	
C307	62 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-187
C312	560 mmf, 500 volts, 5%, cer.	65D 6-131
C317	3.3 mmf, 450 volts, 10%, composition	65B 41-134
C318	5 mf, 200 volts, electrolytic	See C216B
C320	15 mmf, 450 volts, 10%, cer.	65B 28-146
C321	.1 mf, 200 volts, upright paper	64B 16-53
C409	.001 mf, 2 KV, cer. disc	65D 10-181
C413	50 mf, 50 volts, electrolytic	See C216D
C414A	10 mf, 300 volts } electrolytic	67D 15-204
C414B	50 mf, 300 volts }	
C419	.001 mf, 500 volts, 10%, cer. disc	65D 10-184
C420	.001 mf, 500 volts, 10%, cer. disc	65D 10-184
C430	.022 mf, 1.6 KV, tubular, molded	64B 2-43
C431	.047 mf, 1 KV, tubular, molded	64B 2-30
C432	330 mmf, 2 KV, cer. disc, N1500 temp. coeff.	65D 10-186
C433	330 mmf, 2 KV, cer. disc, N1500 temp. coeff.	65D 10-186
C434	120 mmf, 2 KV, cer. disc, N1500 temp. coeff.	65D 10-148
C503	150 mf, 150 volts, electrolytic	67D 15-203
C504A	100 mf, 300 volts } electrolytic	67D 15-306
C504B	100 mf, 300 volts }	

COILS AND TRANSFORMERS

Sym.	Description	Part No.
L201	Phase Shift and Sound IF Coil	72B 186-1
L203	Quadrature Coil	72C 132-37
L303	IF Input Coil	72C 132-40
L304	RF Choke Coil (yellow dot)	73D 24-4
L305	Detector Peaking Coil (yellow dot)	73C 5-20
L306	RF Choke Coil (white dot)	73D 24-9
L307	Video Peaking Coil	73B 5-23
L308	Video Peaking Coil	73B 5-36
L401	Horizontal Lock Coil	94C 17-7
L501	RF Choke Coil (brown dot)	73B 31-1
L502	Filter Choke (1.1 henry)	74B 18-24
T201	Audio Output Transformer	79D 33-15
T302	1st IF Transformer	72C 132-2
T303	2nd IF Transformer	72B 206-1
T304	Sound Take-Off Transformer	72C 185-2
T401	Vertical Output Transformer	79B 43-13
†T402	Deflection Yoke (less picture centering device and yoke cap)	
	yoke using 3.64" dia. cap	94D 147-1
	yoke using 3.15" dia. cap	94D 150-1
T403	Horizontal Output Transformer	79D 77-4

MISCELLANEOUS CHASSIS PARTS

CR301	Video Detector	1N87
CR401	Diode, Dual Selenium	93B 5-4
CR501	Rectifier, Selenium (350 MA.)	93A 4-4
CR502	Rectifier, Selenium (350 MA.)	93A 4-4
M201	Speaker, 4" PM	78B 122-3
M502	Interlocking Plug	88A 36
S501	Switch, On-Off Power	Part of R208

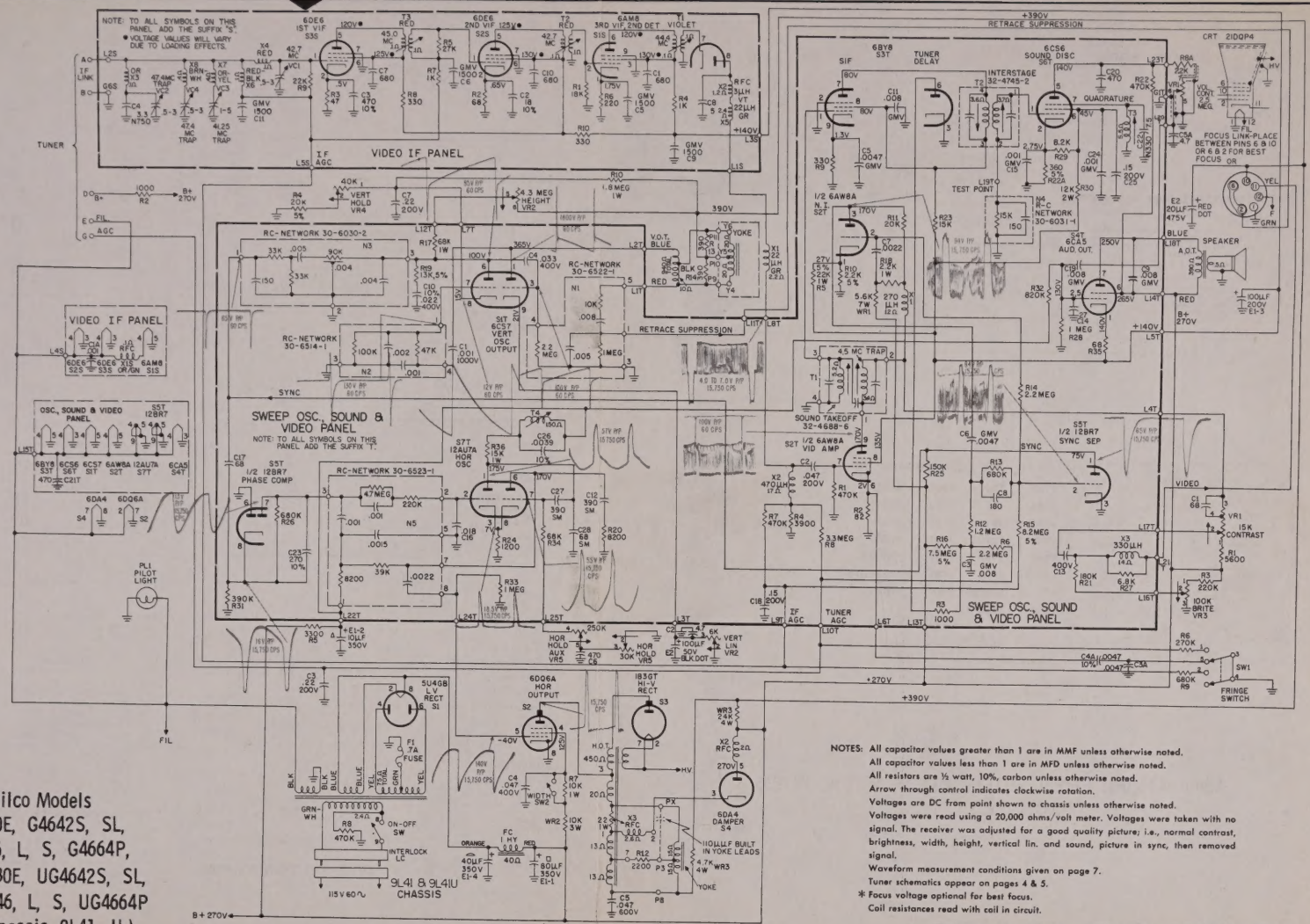
†Picture Centering Device and Yoke Cap

cap, 3.64" dia. for yoke 94D147-1 ... 94D 148-1

cap, 3.15" dia. for yoke 94D150-1 ... 94D 152

Admiral Models P17E31, P17E32, P17E33, P17E34, P17E35 Chassis 15C1

Schematic Diagram Courtesy of Admiral Corp.



Philco Models
G4230E, G4642S, SL,
G4646, L, S, G4664P,
UG4230E, UG4642S, SL,
UG4646, L, S, UG4664P
(Chassis 9L41, U)

NOTES: All capacitor values greater than 1 are in MMF unless otherwise noted.
All capacitor values less than 1 are in MFD unless otherwise noted.
All resistors are ½ watt, 10%, carbon unless otherwise noted.
Arrow through control indicates clockwise rotation.
Voltages are DC from point shown to chassis unless otherwise noted.
Voltages were read using a 20,000 ohms/volt meter. Voltages were taken with no signal. The receiver was adjusted for a good quality picture; i.e., normal contrast, brightness, width, height, vertical lin. and sound, picture in sync, then removed signal.
Waveform measurement conditions given on page 7.
Tuner schematics appear on pages 4 & 5.
* Focus voltage optional for best focus.
Coil resistances read with coil in circuit.

Schematic Diagram Courtesy of Philco Corp.

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